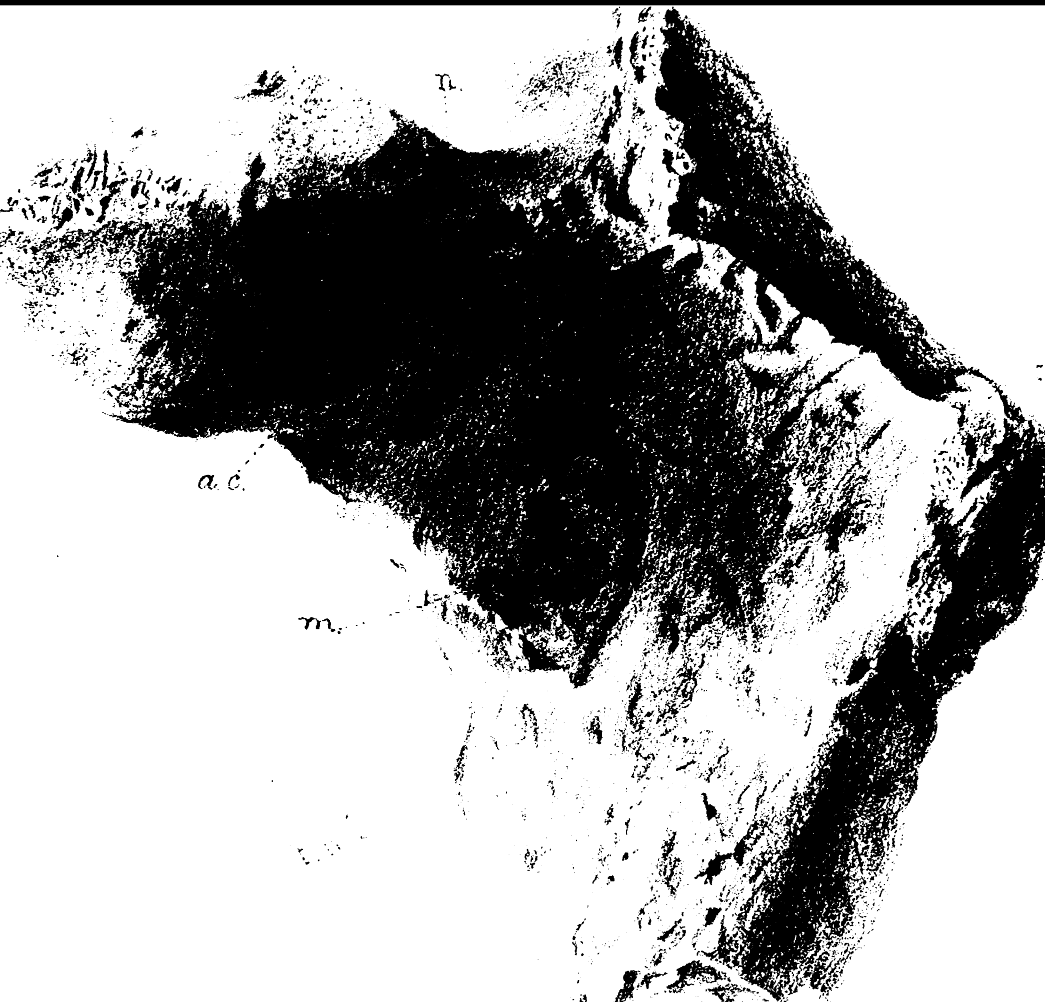

Proceedings of the Royal Society of Queensland

Royal Society of Queensland, Brisbane

THE

PROCEEDINGS

OF THE

ROYAL SOCIETY

OF

QUEENSLAND.

1884.

VOLUME 1.

Brisbane:
PRINTED AND PUBLISHED FOR THE SOCIETY
BY
WARWICK & SAPSFORD, EAGLE STREET.

MAY, 1885.

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HIS EXCELLENCY SIR ANTHONY MUSGRAVE, K.C.M.G.

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R. C. RINGROSE, M.A.
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Williams, W., Esq., Brisbane.
Wright, T., Esq., Brisbane.

Corresponding Members.

Müller, Sir Ferdinand von., K.C.M.G., M.D., F.R.S., &c

CONTENTS.

PLATES.

THE

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Subscription and Entrance Fees.

V.—1. The annual subscription shall be one guinea, payable on or before the 1st of January. Payment of five guineas shall constitute life-membership. Any member who, after notification by the Treasurer, shall have failed to pay his subscription before the 1st of April, shall be held to have retired from the Society, but may be re-instated during the current year by the Council on payment of his subscription for the year.

2. Members elected within a month of the middle of the year may pay a half-year's subscription only, and receive corresponding rights.

3. Members admitted after the year 1884 shall pay an entrance fee of one guinea each in addition to their annual subscription.

Patron.

VI.—1. The Governor of Queensland shall (subject to his consent) be Patron of the Society.

Officers of the Society.

VII.—The officers of the Society shall be a President, Vice-President, a Treasurer, and an Honorary Secretary.

TREASURER.—The duties of the Treasurer shall be to receive, and with the sanction of the Council, disburse all moneys on account of the Society; and at the annual meeting following his term of office, submit a balance sheet audited by an accountant.

HONORARY SECRETARY.—It shall be the duty of the Honorary Secretary to perform the clerical work of the Society, including the receipt of moneys and their transference to the Treasurer.

COUNCIL.—The officers together with five non-official members of the Society, elected by ballot at the annual meeting shall constitute the Council to conduct the affairs of the Society.

Vacancies in the Council shall be filled up by the Council at its next meeting following the vacancy.

Council Meeting.

VIII. Council shall meet at least once every month.

Absence without leave from six consecutive meetings shall cause a vacancy.

Duties of Council.

IX. The duties of the Council shall be to supervise the correspondence, receipts, and expenditure; to select communications for reading, and cause the same to be printed; to order the time and place of meetings; to appoint an auditor for the accounts; and generally to act in the interests of the Society.

Ordinary Meetings.

X.—An Ordinary Meeting shall be held each month at such time and place as the Council may appoint. The order of business shall be as follows:—

The minutes of the last meeting shall be read, and, after confirmation, signed by the chairman.

Candidates for admission to membership shall be proposed, and those proposed at the preceding meeting shall be ballotted for.

Donations, exchanges, and purchases shall be reported.

Motions, of which notice has been given, shall be considered.

Notice of Motions for the next meeting shall be given and read.

Communications in writing shall be read and discussed within limits set by the chairman.

Specimens, models, drawings, &c., may be exhibited, examined, and explained.

Visitors.

XI. Each member present may introduce one visitor at an ordinary meeting, who on the invitation of the chairman may take part in the scientific proceedings of the meeting.

Special Meeting.

XII.—On the receipt of a requisition in writing signed by not fewer than five members, the Council shall order a Special Meeting to be held, within one month of the date of the requisition, provided that the object of the meeting be clearly specified in the said requisition.

Annual Meeting.

XIII.—The Annual Meeting of the Society shall be held in July of each year. The objects of the meeting shall be to choose the Officers and Council for the ensuing year; and to receive the Report of the Council on the general progress of the Society during the past year.

Change of Rules.

XIV.—No change in, or addition to, the Rules of the Society shall be made, except by a resolution carried at a Special Meeting held for that purpose, and unless such change or addition proposed shall have been notified in full to the Secretary not later than one month before the date of the said meeting.

Quorum.

XV.—At any Ordinary Meeting or meetings of Council a quorum shall be formed of three members.

At the annual and at special meetings the quorum shall be ten.

Motion.

XVI.—At all meetings a majority of two-thirds shall be necessary to carry any motion.

By-ldws.

XVII.—The Council shall be empowered to make such By-laws as may be necessary for the better management of the Society. Such By-laws shall not be binding until ratified by a special meeting.

Trustees.

XVIII.—All property whatever belonging to the Society shall be vested in three Trustees in trust for the use of the Society; but the Council shall have the control over the disbursements of the funds and management of the property of the Society.

XIX. In the event of a vacancy occurring in the number of Trustees, it shall be filled up at the next general meeting of the Society following such vacancy.

PROCEEDINGS

OF THE

Royal Society of Queensland.

INAUGURAL MEETING, 8TH JANUARY, 1884.

HIS Excellency Sir ANTHONY MUSGRAVE, K.C.M.G., &c., &c., in the chair.

The Hon. Secretary, reporting progress, intimated that there were sixty-seven members on the roll; that several papers on the various topics within the scope of the Society had been proffered, and that so far it was in a favourable financial position.

DONATIONS.

"Solution of the Celebrated Fundamental Question of Dynamics," by MARTIN GARDINER, C.E. 1883. From the author.

"Results of River and Rain Observations made in New South Wales during 1882," by H. C. RUSSELL, Government Astronomer of New South Wales.

"Results of Meteorological Observations made in New South Wales during 1879." From the Government Astronomer of New South Wales.

"The Sydney Observatory, its History and Progress," with a list of papers which have emanated from the Government Astronomer's department, by H. C. RUSSELL, B.A., F.R.A.S. From the author.

"The Spectrum and Appearance of the recent Comet," by H. C. RUSSELL, B.A., F.R.A.S., Proc. Roy. Soc. N.S.W. 6th July, 1881. From the author.

"Anniversaray Address," by H. C. RUSSELL, B.A., F.R.A.S., President. Proc. Roy. Soc. N.S.W. 3rd May, 1882. From the author.

"Rapport Medical sur les Accidents qui ont suivi plusieurs blessures par flèches prétendues empoisonnées, dans les îles du Pacifique. Avec Rapport de la Commission instituée par le Gouveneur, 1883, à l'effet d'examiner la nature du poison," &c Nouméa, 1883. From the Colonial Secretary.

"Atti della Società Toscana di Scienze Naturali Processi verbali," Pisa, vol. iii. Adunanza del dì iluglio, 1883. From the Society.

"Myology of Chlamydosaurus Kingii, *Gray*," by CHAS. DE VIS, B.A., Proc. Lin. Soc. N.S.W., 1883. From the author.

The President, Hon. A. C. GREGORY, C.M.G., F.R.G.S., delivered the Inaugural Address.

INAUGURAL ADDRESS

HON. A. C. GREGORY, C.M.G., F.R.G.S., M.L.C.

It is in accordance with the usual practice of kindred associations that an address should be delivered by the President of the Society at its annual meetings, adverting to its progress, and also to the general advancement of science in the division to which its labors are more especially directed.

As regards the past history of the Royal Society of Queensland there is little to say, as our previous meetings have been devoted to the arrangement of details of construction; and of the Philosophical Society, with which the new Society has been incorporated, it is sufficient to observe that it has had existence from the time Queensland became a separate province, and that as regards the result of its labors it can point to the Queensland Museum as having taken an important part in the inauguration of that successful and popular institution.

Thus it may be said of our joint concern that it is only to-day that our new vessel has been finally launched on the ocean, where it is to be hoped that we shall enjoy a full proportion of favorable breezes, and that the unavoidable head winds will be only sufficient to keep the crew in training ready for emergencies.

As to the future, the Society has selected Natural Science and its practical application, as the field of investigation—one which cannot be deemed a narrow one, as the limits have not yet been approached, so that there is still ample room for all to extend their researches, each in the direction which may be most congenial, as one of the important functions of societies such as ours is to bring together the results of the speculations of individuals, so as to render them available for the use of the community. The time is not so remote but that it comes within the scope of my own observation when speculative science adopted such an elevated platform that it was almost inaccessable to the practical man, and when theory and practice were viewed as though separated by so wide a chasm as to be scarcely compatible. There were few

books on scientific subjects which were written in a style to be intelligible to any but the highly educated, and the bulk of the community were left under the impression that as so little of any practical value or use was apparent, scientific investigation was only a waste of time and avoidance of real work.

The education of the masses has, however, raised them to a position to understand, at least to some extent, the value of theoretical investigation; while what are termed the applied sciences have provided a bridge between theory and practice, by which the daily work of our hands may be rendered easier, or at least more effective, in its results. Even professional men in the early part of the present century were content to follow the practice and custom of their predecessors, and had little data on which to base improvement; and the outcome was that our structures, machines, and implements were ill-proportioned, involving great waste of labour and material, with inadequate results. Take, for instance, our ships, which in the recollection of those present used to take thrice the time now usual in the voyage from England to Australia. That increase in speed has only been attained through scientific investigation of the forms of least resistance; while the iron of which our huge steamers are constructed could never have been manufactured without the aid of the scientific chemist and his knowledge of chemical equivalents. Nor could the steam engines have been brought to their present perfection but for investigation of a very high order into the specific heat of bodies, and the amount of force developed in their combinations. How 1 lb. of carbon requires 12 lbs. of atmospheric air for its combustion; that 1 lb. of water requires as much heat to change it into steam as would heat 966 lbs. of water 1 degree; and also that the amount of heat required to heat 1 lb. of water 1 degree is equivalent to a force capable of raising 772 lbs. one foot.

On the other hand, turning to machines for freezing, science shows us that to cool 1 lb. of water from 62 degrees to 32 degrees, even in a perfect machine, a force equal to lifting 23,160 lbs. one foot must be expended, and that to change it into ice an additional force of 109,624 foot pounds is absorbed, so that making no allowance for loss of power through friction of machines and the radiation of heat, the manufacture of a pound of ice absorbs as much power as would lift nearly 60 tons a foot.

It has been suggested that the meat supply of Brisbane should be frozen, but have our city fathers realised the fact that to freeze a single bullock as much steam power is required as would lift

the Town Hall and all its belongings a yard high above its foundations, or lift one of the ocean steamers out of the river on to the wharf.

Electrical science has perhaps made the greatest advance of late years. The telegraph, telephone, electric light, and motors have sprung into practical existence in a comparatively short period, and so extraordinary has been their progress that many have been led to expect that electricity would supersede steam power and gas light; but here science shows that as one pound of carbon will absorb ten times the quantity of oxygen as a pound of zinc, which is the most energetic direct source of electricity, so also does carbon develop ten times the energy which is given by an equal weight of zinc; and in actual practice it has been found that the coal-burning steam engine is the most economical source of electricity, whether used for power or light. And though the gas engine has been advantageously applied for this purpose, it is only successful where limited space and intermittent demand make it convenient to burn part of the coal at the gas works, in making the gas which is to be burnt at the place where the power is used. Thus the gas engine is equally a coal-burning motor with the ordinary steam engine.

One of the more important results of the scientific investigation of heat, light, electricity, magnetism, and gravitation or motive force is, that they are all convertible forms of one and the same condition of matter: a condition for which our language has not yet supplied a separate specific term, and it has therefore been provisionally designated "Energy." Energy, like sound, has not a substantive existence, but is only the vibration of a substantive medium through which its undulations or waves are transmitted.

The development of these facts has further led to the important discovery, that though the nature of our terrestial atmosphere is such that we cannot compute it to have a thickness of 100 miles—which is a mere film on the earth's surface—yet there must be some elastic medium occupying the space beyond to the full extent of the visible universe, for light, being only a vibration, could not traverse an absolute vacuum, as there would be no medium to vibrate and convey its undulations.

Here we enter a vast field for speculative investigation with data which tend to the expectation that our present theories regarding the conditions of the celestial bodies may be considerably modified.

The sun, for instance, has been assumed to be a hot mass, which radiated heat in the same manner as a ball of heated metal; and Sir I, Newton and others have computed that it must be many thousand times hotter than red-hot iron, because if heat consisted of substantive particles flowing radially from the solar surface, the temperature would decrease as the square of the distance of the point of observation. When, however, we examine the sun's disc with a telescope black spots are observed, and these are not masses of opaque matter floating on its surface, but holes or depressions, which pass through the bright photosphere and render visible a central body, which shows no signs of incandescence, and the heat of which must, according to our present knowledge, be less than that of red-hot iron; and it therefore appears that the condition of energy which emanates from the sun is not solely that of light or heat, and that the thermometric temperature of the sun may not exceed that of the flame of a common candle.

In thus straying into the regions of theoretical enquiry, I have perhaps transgressed the proper limits of an address to a Society whose objects are specially to render science available for practical uses, and will therefore leave the "Celestial" (who by the way is not very popular just now) and return to our own national requirements.

It may perhaps be asked how it is that the vast resources of science which have been open to the world have been availed of in such a tardy manner, but it may be answered the extremely conservative character of the British workman has always presented a material obstacle to improvement. Their fathers and grandfathers did things in such or such a way, and did very well, why then should new-fangled methods be adopted? What would be the use of the workman's present knowledge if he had to learn something new? And the only remedy, which has proved in any degree effective, has been the education of the nation, so as to enable them to see and hear things with their own eyes, ears, and intelligence, and not solely through those of past generations.

I have seen crowds of men assembling to destroy thrashing machines, have known them to disable reaping and other labor-saving machines, under the impression that machinery decreases the demand for manual labour; and it is not so many years since agricultural machines, railways, and sewing machines were held to be equally subversive of the public weal, as the employment of colored labor is at the present time.

The actual result of machinery has been to vastly increase the employment of labour, and to enable the workman not only to profit by the use of his hands, but also of his head.

It has been the teaching in schools, supplemented by the instruction gained by moving about the world and contact with new conditions in new countries, which has rendered the British Colonist a much more intelligent and successful citizen, and it has been from similar causes that such great improvement has been made in America in the method of constructing so many of our domestic appliances.

Thus we see how important it is to the community as well as to the individuals composing it, that a knowledge of practical science should be extended, and that societies like ours are not mere associations for the discussion of fanciful theories, but that they are institutions for the collection and utilization of information which is of the utmost importance to the state and to our social and material progress, and I trust that each member of the Royal Society of Queensland will, according to his opportunities, lend a helping hand in collecting material for such important work.

TUESDAY, FEBRUARY 12, 1884.

THE VICE-PRESIDENT, J. BANCROFT, M.D., IN THE CHAIR.

DONATIONS.

"Cultural Industries for Queensland," 1st Series, by Lewis Adolphus Bernays, F.L.S., Brisbane, 1883. From the Author.

"Report on the Mines of Herberton, Western and Thompson Creek Districts, and the Silver Mines of the Dry River, Queensland," by R. L. Jack, F.G.S., Government Geologist, Brisbane, 1883. From the Author.

"The Treatment of Tin Ore in Europe," by Z. Wagemann, Melbourne, 1883. From the Author.

Specification of Patent to Henry Harris Lake, for "Process for Extracting Metals from their Ores," London, 1883. From A. J. Thynne, Esq., Brisbane.

"On Ogyris Genoveva, *Hewitson*, and its Life History," by W. H. Miskin, Esq., Brisbane. Trans. Ent. Soc., 1883, Part IV. From the Author.

CONTRIBUTIONS TO THE QUEENSLAND FLORA

BY

F. M. BAILEY, F.L.S.,

Government Botanist of Queensland.

The subject of the present paper is an enumeration of the plants which have been found since, or that were overlooked in compiling the "Synopsis of the Queensland Flora," to which work this may be taken as a first supplement.

Thus it will be seen that from specimens received from the Endeavour River, Baron Von Mueller has founded the new genus Husemannia, an addition to the Order Menispermaceæ. He has also added to Rhamneæ two new plants—a Ventilago from Rockingham Bay, and a Stenanthemum found at Stanthorpe, also to the Order Thymelæaceæ one to the already large genus Pimelea.

It will be also seen that while at Helidon a few months ago I was fortunate enough to meet with a new species of Rubus, the well-known genus of Rosaceæ. The favourite Order Orchideæ has been increased by six new Dendrobiums, four of which have been received from Northern and two from Southern Queensland. The Ophiopogon mentioned as having been found at Enoggera Creek is interesting, being the first plant of the tribe Ophiopogoneæ as yet met with in Australia, but I think it might be well before claiming this as indigenous that further specimens should be met with.

Lycopodiaceæ has been increased by the addition of a pretty species of Selaginella from the Johnstone River, whilst a Trichomanes and an Asplenium from the Johnstone River, and a Polypodium from Helidon have been added to our Fern Flora. It is an interesting feature also to find that out of the 80 species of Fungi recorded, about one-third are new, and have been described and several figured in the last year's transactions of the London Linnean Society by the celebrated mycologists, Messrs. Berkeley and Broome.

ORDER MENISPERMACEÆ.

Husemannia, *F.v.M.*, *South. Sci. Rec. May*, *1883.*
H. protensa, *F.v.M.*
Hab. Daintree River, Pentzke ; Endeavour River, Persieh.

ORDER PORTULACEÆ.

Portulaca napiformis, *F.v.M.*
Hab. Emerald. P. A. O'Shanesy,

P. australis, *Endl.*
Hab. Emerald. P. A. O'Shanesy.

ORDER MELIACEÆ.

TRIBE CEDRELEÆ.

Flindersia Schottiana, var. pubescens, *F.v.M. Fragm V.* 142.
Hab. Rockingham Bay.

This tree is worthy of notice here as being another of our tropical trees that will thrive in the southern parts of the colony. This has been fully proved by the trees planted by Mr. Hill in the Wickham Terrace Reserve, which are forming fine heads, and bid fair to become the best shade-giving trees on the Reserve.

ORDER RHAMNEÆ.

TRIBE VENTILAGINEÆ.

Ventilago ecorollata, *F.v.M., South. Sci. Rec.* 1883.
Hab. Rockingham Bay, Dallachy, Endeavour River. Persieh.

TRIBE RHAMNEÆ.

Stenanthemum, *Reissek.*
S. Scortechinii, *F.v.M., Melb. Chem. and Druggist,* 1884.
Hab. Stanthorpe. Rev. B. Scortechini.

ORDER LEGUMINOSÆ.

TRIBE PODALYRIEÆ.

Oxylobium ellipticum, *R. Br.* var. angustifolium.
Hab. Point Danger. H. Schneider.

TRIBE BAUHINIEÆ.

Bauhinia Cunninghamii, Benth. Flinders, F. v. Meuller: Etheridge River, E. W. Armit.

ORDER ROSACEÆ.

TRIBE RUBEÆ.

Rubus Muelleri, *Sp. Nov.*

A large scrambling shrub. Branches glabrous, armed with scattered recurved prickles. Leaves pinnate 3 to 9 in. long, of 3 to 9 ovate, acuminate or when small often obtuse leaflets, coarsely and doubly toothed; flowers white in terminal panicles of 4 to 10 flowers. Bracts narrow, laciniate; sepals slightly hoary, points subulate. Petals spreading not so large as in *R. Rosæfolius.* Fruit red, glossy, nearly globular, ½ to 1 in.

diameter. Carpels small and numerous, succulent with an agreeable acid flavor. Hab. Near Waterfalls, Helidon. Bailey.

This differs from *R. rosæfolius, Sm.*, its nearest ally, in its stronger more scrambling habit, in wanting the usual pubescence of that species, and in the form of pinnæ being ovate or obovate, never approaching lanceolate, and the much longer petiolules. The inflorescence is more like *R. moluccanus, Linn.*

ORDER EPACRIDEÆ.

TRIBE STYPHELIEÆ.

Leucopogon virgatus, *R. Br.*
Hab. Point Danger. H. Schneider.

ORDER PROTEACEÆ.

Hakea pedunculata, *F.v.M. Melb., Chem. et Drugg.*, 1883.
Hab. Endeavour River. W. A. Persieh.

ORDER THYMELÆACEÆ.

TRIBE EUTHYMELÆEÆ.

Pimelea penicillaris. *F.v.M., Melb. Chem. and Druggist*, 1883.
Hab. Southern Queensland.

ORDER ORCHIDEÆ.

TRIBE EPIDENDREÆ.

SUB-TRIBE DENDROBIEÆ.

Dendrobium speciosum, *Sm.* var. nitidum. *

Stems strong and numerous, forming large masses like *var. Hillii*, from 1½ to 2 ft. high, of a nearly even diameter of about ½ in., usually smooth and shining, fluted, nearly free from torn bases of old leaves; leaves 3 to 5, lanceolate, 6 to 7 in. long, 1½ to 2 in. broad, coriaceous, the upper surface usually shining. Racemes 6 to 8 in. long, bearing from 24 to 30 flowers, at first yellowish green, afterwards pure white, pedicels over 1 in. long, spur short, outer segments 6 to 7 lines long, and about 2 lines broad, the inner segments or petals about the same length, but narrower than the outer. Labellum short, the lateral lobes marked with transverse purplish lines, the middle lobe apiculate, the longitudinal plates yellow. Hab. Cairns. Collector unknown.

Described from plant blooming at Bowen Park. This form differs from others chiefly in its short dense raceme and glossy foliage.

* NOTE.—The three plants marked with an asterisk (*) were published in the newspaper report of the last meeting of the Queensland Philosophical Society, a publication scarcely meeting the requirements of scientific currency.

Dendrobium speciosum, *Sm.*, var. delicatum. *

Stems forming dense wide patches on rocks, 6 to 9 in. high, swelling into pseudo-bulbs, at the base like *D. Kingianum*, fluted, and more or less clothed with the torn bases of old leaves. Leaves 3 or 4, from 3½ to 4½ in. long, and ¾ to 1¼ broad, the apex obtuse or emarginate, in texture resembling those of *var. fusiforme*. Racemes 1 or 2, from 7 to 8 in. long, bearing 8 or 9 distant, fragrant white flowers, the outer segments 6 to 8 lines long, the inner ones about the same length, thin and delicate and much narrower, the spur rather long and curved. Labellum of a very delicate texture, white speckled with purple, the middle lobe apiculate, the longitudinal plates of the disk yellow, column white.

Hab. Main Range. Collected by B. Crow aud C. H. Hartmann.

Dendrobium Keffordii, *Sp. Nov.*

Stems clustered, very numerous, slender, 1 to 4 ft. high, the lower part naked and cane-like or more or less clothed by the torn bases of old leaves, the upper half leafy. Leaves linear lanceolate, the apex rather obtuse, 3 in. long, and about 3 lines broad near the base, of a thin texture, the sheathing base prominently striate. Racemes lateral, numerous, shorter than the leaves, 2-flowered. Flowers yellowish speckled with purple; pedicels 4 lines long. Sepals or outer segments from a broad base tapering to filiform points, about 1 in. long, the basal spur short. Petals or inner segments similar to the sepals but smaller. Labellum 3 or 4 lines long, the lateral lobes embracing the column, the middle lobe bordered by a dark purple fringe. the point elongated and recurved. Disk bright yellow with two lines of prominent calli, column slender.

Hab. Johnstone River. Collected by W. R. Kefford.

This addition to the large genus Dendrobium in foliage and inflorescence approaches *D. agrostophyllum*, *F.v.M.* and *D. Baileyi. F.v.M.*, while in the form of flowers it closely resembles *D. tetragonum*, *A. Cunn.*

Dendrobium Kingianum, *Bidw.*, var. pallidum. *

Stems clustered, often forming broad dense matted masses of several feet in diameter, the height of stem from 2 to 4 in, slender except the base which is enlarged into pseudo-bulbs, all more or less covered by the torn bases of old leaves. Leaves 2 or 3, somewhat thin, 2 to 3 in. long, and about ½ in. broad near the base, oblong-lanceolate. Racemes slightly exceeding

the leaves, slender and bearing about 3 or 4 white or lilac stained flowers.

Hab. on rocks Main Range, collected by B. Crow and C. H. Hartmann.

This variety differs from the usual form in being much smaller, forming more dense masses, and in the colour of the flowers.

Dendrobium Stuartii, *Sp. Nov.*

Stems slender, prominently striate, 6 to 18 in. long, leafy, of a purplish color, the old leafless ones, bearing numerous short racemes of usually 3-flowers. Leaves lanceolate, 1 to 2 in. long. Racemes axillary, the rhachis about ½ in. long, and pedicels of about the same length. Sepals and petals narrow lanceolate, yellowish-green, ½ in. long. Spur straight about 3 lines long. Labellum tomentose with fringed undulate edges, the disk plates not prominent, obtuse ovate ¾ in. long including the claw which is articulated to the base of the spur, (as in Bulbophyllum) without lateral lobes, beautifully marked with forked red veins, which are crossed by two longitudinal ones. Column short, white, the very narrow wings with a purple edge. Flowers very fragrant.

Described from a single plant now flowering in the Brisbane Botanic Gardens, sent from near Herberton by J. W. R. Stuart, Esq., from whom several other rare and perhaps new species have been received.

Dendrobium uniflos, *Sp. Nov.*

Rhizome creeping, much matted, and clothed with the torn old sheaths. Stems numerous, erect, 2 to 3 in. high, 1 line diameter, bluntly ribbed and bearing at the top a single leaf and flower. Leaf about 2 in. long, 4 lines broad, sharply keeled, oblong with an emarginate apex, articulate by its broad base to the stem. Pedicel at the base of the leaf, 6 lines long, curved and supported at the base by a scarious ribbed bract about 3 lines long and 1 line broad. Sepals oblong-ovate about 2½ lines long, spreading, white, the dorsal one narrower than the lateral ones, which latter are produced with the column into a short broad spur. Petals narrow, white, incurved. Labellum shortly connate with the basal projection of the column, lateral lobes very narrow, middle lobe cordate, about 1 line broad, the surface glandular, texture thick, transversely furrowed, orange coloured. Column prominent, the wings narrow, ending at the top in a sharp incurved tooth. Anther lid purple. Near Herberton. J. W. R. Stuart.

Described from plant in Brisbane Botanic Garden.

Dendrobium striolatum, *Reichb.* var Beckleri, *F.v.M.*, *Fragm.* *V.* 95. Figured in Fitzgerald's Orchids : Part VI.
Hab. Enoggera Ranges. D. Macpherson.

ORDER HÆMODORACEÆ.

TRIBE OPHIOPOGONEÆ.

Ophiopogon, *Ker. in Bot. Mag.*
O. japonicus, *Ker. in Bot. Mag. t.* 1063.
Hab. Enoggera Creek. W. R. Kefford.

There may be some doubts as to whether this Japanese plant is truly indigenous. It was found at Enoggera Creek by Mr. Kefford at a spot not favorable to the idea of its having been introduced Of the plants found some may be seen at Bowen Park, and others at Mr. Bernays', who drew my attention to it a short time since when the plant was in full flower.

ORDER RESTIACEÆ

Hypolæna fastigiata, *R. Br.*
Hab. Point Danger. H. Schneider.

ORDER LYCOPODIACEÆ.

Selaginella leptostachya, *Sp. Nov.*

Stems creeping and branching as in *S concinna*, but a more rigid robust plant, leafy throughout as in that species. Larger leaves in two rows, distichously spreading, lanceolate, acute or obtuse, about 1 line long, the inner ones somewhat falcate, the lower part appressed, the upper part spreading, all shortly keeled, margins serrate. Spikes terminal, 1 to 1½ in. long, and scarcely 1 line in diameter. Bracts acuminate, keeled, and closely imbricate in 4 rows, the tips scarcely spreading.
Hab. Johnstone River : W. R. Kefford. Nerang Creek : H. Schneider.

ORDER FILICES.

TRIBE HYMENOPHYLLEÆ.

Trichomanes caudatum, *Brack : Ferns U. S. Expl. Exped.*
Hab. Nerang Creek : H. Schneider. Fraser Islands : W. Hill.

T. Filicula, *Bory.*
Hab. Tropical Queensland. F. M. Bailey, W. R. Kefford.

This small "bristle fern" has been frequently collected in tropical Queensland but mostly in a sterile state, and the specimens mixed with those of its near ally *T. pyxidiferum*, *Linn.* Indeed more than ten years ago Dr. Prentice pointed out to me

specimens of it mixed with those of the latter I had brought from Rockingham Bay. Now happily the occurence of *T. Fitlicula* in Queensland is placed beyond doubt by the excellent specimens of that species brought from the Johnstone River by Mr. Kefford. It may here be pointed out that the principal distinguishing mark between these two ferns is in the form of indusium, that of *T. Filicula* being prominently two-lipped, while that of *T. pyxidiferum*, although dilated at the mouth is scarcely lipped.

Trichomanes Johnstonense, (Pl. I.). *Sp. Nov.*

Rhizome long, creeping, rigid, knotted, clothed with black bristle-like scales. Stipes somewhat angular, scarcely winged, 2 to 4 in. long, of a dingy brown color, the immediate base scaly as the rhizome. Fronds bipinnate with deeply pinnatifid or bipinnatifid pinnules, 3 to 6 in. long, 1½ to 4½ in. broad, the rhachis slightly winged, the linear segments very narrow, 1-nerved. Indusia few on the lower lateral segments of the pinnule, free, erect, much tapering towards the base, the orifice two-lipped. Receptacle exserted usually long. Hab. Johnstone River. W. R. Kefford,

In the general appearance of the frond this new species somewhat resembles the Jamaica form of T. rigidum, from which however it is readily known by its creeping not tufted habit, and form of indusium.

SERIES A.

TRIBE POLYPODIEÆ.

Asplenium resectum, *Sm.*, var australiense.

Rhizome shortly creeping. Stipes close together, slender, 4 to 12 in. long, glossy, nearly black. Fronds pinnate, membranous, 6 to 13 in. long, with a rather long caudate, serrate apex, lower pinnæ 3 or 4 in. long, and about ½ in. broad at the base, from which they gradually diminish in size until they reach the tail-like apex of the frond. Pinnæ distinctly petiolulate except at the apex, where the frond becomes pinnatifid, subfalcate, and the sterile ones often obtuse, but the fertile ones usually with elongated points, superior base, truncate parallel, with the rhachis never auricled, inferior base for a third or more of their length cut off as it were in a curved line, so that the costule here becomes the margin, the whole of the rest of the

pinna evenly serrated, veins forked. Sori oblong occupying the centre of pinna, about an equal distance from the margin as from costule. Hab. Johnstone River. Collected by W. R. Kefford.

The meeting with this fern in Australia is of more than usual interest, as by its short rhizome, &c., it fully connects Swartz's West Indian species, *A. lætum*, with the Old World species, *A. resectum*, of Smith. I am led to this conclusion not only from published descriptions, but from examination of a fine specimen of Swartz's rare fern in Lady Musgrave's excellent collection of Jamacia ferns.

Asplenium marinum, *Linn.*, var. difforme, Hab. Nerang Creek, H. Schneider.

Doubtless *A. obtusatum*, *Forst.* apprcaches in some of its forms too near to *A. marinum*, *Linn.*, to be retained as a distinct species. I have therefore thought it well to follow Baron Mueller and the Rev. Dr. W. Wools in placing the above variety under the Linnean name.

SERIES B.

Polypodium confluens, *R. Br.*, var. lobatum. Hab. Pearson's Waterfalls, Helidon. F, M. Bailey.

This differs from the normal form by its fronds being variously and deeply lobed, resembiing in this respect the fronds of P. pustulatum, *Forst.*

ORDER FUNGI.

SUBORDER HYMENOMYCETES.

Agaricus, *Linn.*

(Lepiota)

A. dolichandos, *Berk. et Br.* Brisbane River. (Bailey.)
A. cepæstipes, *Sow.* Edge of Enoggera Dam. (Bailey,)

(Pleurotus)

A. thozetii, *Berk. et Muell. Jour. Linn. So. Vol.* 18.

(Nancoria)

A. melinoides, *Bull.* Toowong Road. (Bailey.)

(Psatyrella)

A. semiliber. *Berk. et Br.* On bark of scrub trees, Enoggera. (Bailey.)

(Clitocybe)

A. rheicolor, *Berk.* On a stump in 3-Mile Scrub. (Bailey)

(Collybia)

A. laccatimus, *Berk. Journal of Linn. So., Vol.* 18. Amongst dead leaves, Moreton Bay.
A. coagulatus, *Berk. et Br.* Brisbane. (Bailey.)

(Armillaria

A. melleus, *Vahl.* Enoggera. (Bailey.)

(Tricholoma.)

A. civilis, *Fries.* Brisbane. (J. F. Bailey.)
Russula sanguinea, *Fries.* Burnett River. (Watson.)
Marasmius Muelleri, *Berk.* Herbert Creek. (E. M. Bowman.)
M. equicrinis, *B. v M.* Dalrymple Creek. (Lieut Armitage.)
M. exocarpi, *Berk.* Rockhampton. (A. Thozet.)
Lentinus catervarius, *Berk et Br.* 3-Mile Scrub. (Bailey.)
L. exasperatus, *Berk. et Br.* Brisbane. (Miss A. R. Mills.)

L. punctaticeps, *Berk. et Br.* Brisbane River. (Bailey.)
Panu's suborbicularis, *Berk. et Br.* On bones of a whale in the old Museum yard. Brisbane. (Bailey.)

Xerotus albidus, *Berk. et Br.* 3-Mile Scrub. (Bailey.)
X. lateritius, *Berk. et Cooke.* 3-Mile Scrub. (Bailey.)
Boletus hædinus, *Berk. et Br.* Ironbark Ridges. (Bailey.) I think it probable this is the fungus which forms those large masses of mycelium often met with in turning up the soil of the hard stony ridges about Brisbane.

Polyporus, *Fries.*

(Pleuropus)

P. orcadideus, *Berk. et Br.* Trans. Linn. Soc. Vol. II. 3-Mile
D. Scrub. (J. F. Bailey.)
P. Guilfoylei, *Berk et Br.* Maroochie. (Bailey.)
P. grammocephalus, *Berk et Br.* Enoggera Creek. (Bailey.)
P. nephridius, *Berk.* Taylor's Range. (Bailey.)

(Anoderma)

P. pelliculosus, *Berk.* Maroochie. (Bailey.)

(Placoderma)

P. ochroleucus, *Berk.* On fences, Brisbane. (Bailey.)
P. lineato-scaber, *Berk et Br.* Daintree River. (J. E. Tenison Woods.)
P. testudo, *Berk.* Maroochie. (Bailey.)

(Inoderma)

P. luteo-olivaceus, *B. et B.* var tenuis. Maroochie. (Bailey.)
P. anebus, *Berk.* Maroochie. (Bailey.)

(Resupinaria)

P. hispidus, *Fries.* 3-Mile Scrub. (Bailey.)
P. medulla-panis, *Fries.* Enoggera Creek. (Bailey.)
P. eriophorus, *Berk. et Br.* On dead pine twigs. (Bailey.)
P. callosus, *Fries.* On the rafters of the old Works Office. (Bailey.) Very destructive to pine wood.

Dædalea scalaris, *Berk et Br.* Main Range. (B. Crow.)
Hexagona rigida, *Berk.* Brisbane River. (Bailey.)
Merulius Baileyi, *Berk. et Br.* Enoggera. (Bailey.)
M. lacrymans, *Schumacher.* Main Range. (J. Anderson.)
Radulum, *Fries.*
R. molare, *Fries.* On old Peach tree, Brisbane. (Bailey.)
Grandinia, *Fries.*
G. granulosa, *Nees. var. ochracea.* Rockhampton. (A. Thozet.)
Thelephora caryophyllea, *Pers.* Burnett River. (Watson.)
Thelephora, (stereum) spongiæpes, *Berk.* Logan River. (Rev. B. Scortechini.)

Stereum spathulatum, *Berk.* Brisbane. (Bailey.)
S. illudens, *Berk.* On a stump, Cleveland Road. (Bailey.)
S. simulans, *Berk. et Br.* Enoggera. (Bailey.)
S. complicatum. Taylor's Range. (Bailey.)
Hymenochæta rubiginosa, *Lév.* Taylor's Range. (Bailey.)
Corticeum bambusicola, *Berk. et Br.* On old bamboo (Bailey.)
C. anthochroum, *Fries.* On she oak, Rockhampton. (A. Thozet.)
Clavaria portentosa, *Berk. et Br.* Brisbane River. (W. Ewart.)
C botrytis, *Pers.* Brisbane River. (W. C. Kays.)
C, miltina, *Berk.* Brisbane. (Bailey.)
C. cristata, *Holms.* Near Connell Town. (Bailey.)
C. lætissima, *Pers.* Lockyer Creek. (C. H. Hartmann.)
Calocera cornea, *Fries.* On sawn timber of a bridge near Brisbane. (Bailey.)

SUB-ORDER GASTEROMYCETES.

Phallus quadricolor, *Berk. et Br.* South Brisbane. (Thos. Weedon.)

Geaster floriformis, *Vitt.* Cunningham's Gap. (Bailey.)

Lycoperdon cælatum, *Fries.* Logan River, on dead timber. (Bailey.)

Tilmadoche mutabilis. *Rostaf.* On rottten gum wood, Rockhampton. (A. Thozet.)

Chondrioderma difforme, *Pers.* On young grass 3.Mile Scrub. (Dr. Bancroft.)

Arcyria incarnata, *Pers.* On old logs, Enoggera (Bailey.)

Cyathus pusio, *Berk.* On Gum wood, Rockhampton. (A. Thozet.)

C. fimicola, *Berk* Rockhampton. (A. Thozet.)

C. pezizoides, *Berk.* Rockhampton. (A. Thozet.)

SUB-ORDER CONIOMYCETES.

Tilletia epiphylla, *Berk. et Br., Trans, Linn. So. Vol. II.* On leaves of maize. (Dr. Bancroft.)

Æcidium nymphoidearum, *Berk. et Br. Trans. Linn. So. Vol. II.* On Linnanthemum indicum. (F. R. Hall and Dr.Bancroft).

SUB-ORDER HYPHOMYCTES.

Thozetia, *Berk. et Muell.*

T. nivea, *Berk.* Rockhampton. (A. Thozet.)

Sphærostilbe cinnabarina, *Tul.* On bark, Enoggera. (Bailey.)

S. dubia, *Berk.* On Ægiceras, Rockhampton. (A. Thozet.)

Rœstelia polita, *Berk. Trans. Linn. So. Vol. II.* On Jacksonia scoparia R. Br. (Bailey.)

Oidium leucoconium, *Desm.* Considered by Mr. Berkeley a young state of Erysiphe pannosa. On pumpkin leaves. (Bailey.)

SUB-ORDER ASCOMYCETES.

Peziza thozetii, *Berk. Linn. So. Vol. XVIII.* Rockhampton. (A. Thozet)

Ascobolus Baileyi, *Berk. et Br., Trans. Linn. So. Vol. II.* On cow-dung.

Glœosporium cucurbitarium, *Berk. et Br.* On water melon fruit. (Bailey.)

Hypocrea discoidea, *Berk. et Br.* On a Japanese plant at Bowen. (Bailey.)

Hypoxylon serpens, *Fries.* On Wood, Brisbane. (Bailey.)

H. concentricum, *Grev. Var. Minus. Berk et Br.* Enoggera. (Bailey.)

Graphiola phœnicis. *Fries.* On Date palms. (Bailey.)

Sphæropsis Tricorynes, *Berk. et Br.* On Tricoryne anceps, Tropical Queensland, (Rev. J. E. Tennison-Wood.)

Capnodium elongatum, *Berk et Desm.* On a native shrub infested by scale insect. (Dr. Bancroft.)

Meliola corallina, *Mont. Fl. Chile. Fig. Trans. Linn. So. Vol. II.* On leaves, Maroochie (Bailey.)

HOT SPRINGS AND MUD ERUPTIONS ON THE LOWER FLINDERS RIVER.

By E. PALMER, Esq.. M.L.A.

(Plate II.)

These are somewhat similar in appearance to springs found between the Warrego and Darling Rivers near Bourke, and evidently owe their origin to the same natural causes. A few small ones occur on the Barcoo below "Inniskillen," and Stuart the explorer mentions similar in his overland journey through Central Australia, and also one or two hot springs. In latitude 29° 17′ 43″ he particularly describes the "Elizabeth" and "Beresford" Springs; the latter has a strong flowing stream, sufficiently strong to drive a flour mill. The hill from which the stream issues is one hundred feet above the level of the plain, the water coming from the very top. Stuart's horse got bogged on the top and he had some difficulty in getting it out. He also mentions the fact, that while some have a peculiar disagreeable taste of soda, others are fresh and sweet.

On the Lower Flinders they occur in separate clusters, each consisting of innumerable small eruptions, surrounding one or two large central or main springs, within a radius of a mile

or so, and all more or less in a state of activity, that is, they emit streams of thin mud or water intermittently. They are found on either side of the river, and seem to have no connection with, or influence on, the water in the river, which may be said to be only a surface water. Although possessing a striking similarity to each other, still any connection between them must exist beneath the present course of the Flinders, which is cut out of the level plains by the annual tropical rains, and is a river of recent times; no hollow or valley exists where the course of the river runs, the banks are nearly perpendicular, but not very deep, while the level plains extend right up to the bank of the river. The springs belong to an older formation than the present river system, and must derive their force from some very distant inland mountainous country.

From where the river leaves the high country (which consists of a lava overlying the original sandstone) to its entrance into the Gulf of Carpentaria, its course is through level, treeless plains of cretaceous formation, with occasional belts of fine sandstone, sometimes bearing fossil shells. The course is generally a little to the north of west, and is over 500 miles in length. The only elevations are Mount Browne, in about 20° south latitude, a low, stony rise of ironstone and granite, rising from the plain and about a mile from the river on the right side; and Fort Bowen, twenty miles west, similarly situated with regard to the river, and rising also abruptly from the open plains. These are the only rises of any consequence near the river. And at both of these small mountains numbers of springs and mounds of erupted mud, coated with a whitish crust of soda, lie scattered about, with stumps of large tea-tree and reeds, and pools of discoloured water throughout; while at Mount Browne occur two hot springs on the south side, with a temperature of 120° Farenheit at the surface. The water stands in a large baisin on a mound raised many feet above the level of the plain, and covered with gigantic tea-trees (Melaleuca leucadendron), amongst the matted roots of which the hot water steams in clear, shining, crystal pools. The basin, or cavity, is fathomless, while the roots and branches lying in it are coated with a soft, green vegetable matter, with air bubbles attached, small bubbles of carbonic acid innumerable, which are continually rising to the surface. The water is too hot to bear the hand in for any length of time, but when cooled is good for use, and always bright and clear, and free from any taste, while that in the adjoining cold springs

is extremely disagreeable. No change has been observed in the hot springs in level or temperature since 1865, when a cattle station was settled there by Mr. James Gibson. The ground round all these springs is treacherous, is hollow, shakes to the tread, and feels like a huge blister, merely covered with a skin of soil, held together by roots and rushes, over which one can walk. At times the pressure from below forces the thin crust upwards, and a flow of thin brown liquid mud spreads about, sometimes in great quantities. In one of the springs at Mount Browne flakes of granite are forced up, and lie on the surface. It seems as if a connection existed down by the side of the mountain to subterranean regions, whence the hot water flows, and is kept at one constant level and temperature. Most of the mud springs have formed large mounds, or cones, by constant overflow, and the water now stands on the top, while the surrounding parts are spongy, and liable to break through when stock comes near them; at others lagoons are formed, and kept at a uniform level by the flow of water. The occurrence of these hot and cold mineral springs, suggests the possibility of obtaining supplies of water on the artesian principle over some portion at least of these extensive plains. Some mud springs, as they are called, opened at Manfred by a small shaft at the side, produced a permanent flow of good water. The overflow from some of the mineral springs deposits a white incrustation, "which on analysis by Dr. Flight, under the direction of Professor Maskelyne, afforded :—

Water	27·793
Silica	0·600
Chlorine }	3·369
Sodium }	2·183
Carbonic acid	33·735
Soda	31·690
	99·370

The sulphuric acid, of which there was a small portion, was undetermined." (Daintree, Quart. Geolog. Journ. Vol. xxviii, p. 285.)

Fresh ground keeps continually breaking up, or is forced up, while old cones are sometimes falling in, forming hollows half-full of reddish water, strong as lye, and quite undrinkable. None of the springs are isolated, but confined to the vicinity of one or other of the half-dozen groups which compose the collection on the Lower Flinders. The direction of these groups is in a

north and south course from each other, with the Flinders River dividing them, and they are comprised within a line or distance of eighty miles. Above Dalgonally Station, on Julia Creek, some very extensive mounds are an indication of the force of the pressure from below, while an open spring between it and the Flinders has numerous small fish in it. A thoroughly scientific description of these numerous and wonderful displays of natural forces would prove very interesting and instructive. The vegetation surrounding them is peculiar, and somewhat distinct from that of the plains. The locality of any of the groups of mineral springs is indicated by the presence of gigantic tea-trees surrounding them, and many of the mounds present a pleasing green appearance, from being covered with a sward of Fimbristylis in such masses, fallen or recumbent, as to form a safe carpet, yielding and soft, but dense enough to support cattle going in to feed on the various grasses found there.

In ancient days the same springs have proved a trap for too confiding animals, as is proved by the fact of some bones having been ejected in the mud from one of them; the bones are coloured, but in a good state of preservation.

A collection of plants made at a dry time of the year from one or two of the springs near Fort Bowen afforded :—

1. Melaleuca leucadendron, *Linn.* The large tea-tree. Also a smaller species of melaleuca, with hard, thin bark, and of a dwarfed or stunted growth.

2. Chenolea (or Bassia) diacantha, *F. v. M.* A prickly "roley-poley," found in bare places in large bunches, with terrible spines half an inch long and very sharp.

3. Pennisetum compressum, *Rich Brn.* A grass, three feet high, found all through the springs, with a large terminal reddish flower.

4. Pluchea, *sp.* Herb, eighteen inches high, in quantities round the springs.

5. Typha augustifolia, *Linn.* The common rushes, with cylindrical brown tops.

6. Teucrium integrifolium, *F. v. M.* Herb, one foot high, with small white flower, leaves opposite, lanceolate. Very plentiful.

7. Trianthema crystallina, *Vahl.* Herb, with short, fleshy leaves and reddish stems; grows in bare places round springs.

8. Portulaca filifolia, *F. v. M.* Herb, erect, eighteen inches high, branching, bright yellow flowers. Plant very brittle.

9. Fimbristylis, *sp.* Rush, growing densely over soft springs, forming a compact mass.

10. Eragrostis, *sp.* A grass about two feet six inches high.

11. Schoenus, *sp.* Grass, two feet high, in large, strong bunches, growing over the hot springs and through the water.

12. Phragmites Roxburghii, *Kunth.*

Some springs with similar characteristics are found about ten miles north of Gamboola Station, on the Mitchell River, with Pandanus growing very plentifully through them.*

A spring on the Ennasleigh River, about thirty miles from Georgetown, is hot enough to maintain a state of ebullition. This last occurs near a great outflow of lava, and may be accounted for by assigning the same cause to both it and those of the Flinders.

* Mr. Mar, the Government Analyst, reports as follows, on a rather earthy sample of the saline incrustation from these springs:—

	Per Cent.
Soda	37·54
Lime	2. 8
Oxide of iron	2·19
Sand	31·72

The acids are undertermined, but carbonic acid is chiefly represented. The water of the spring is alkaline carbonated.

THE MOA (DINORNIS) IN AUSTRALIA.

By C. W. DE VIS.

(Plates III. and IV.)

Though now for nearly fifty years it has been known that Australia of yore, like New Zealand of late, was the home of massive flightless birds, our knowledge of that dead race has not hitherto gone beyond the opening stage. The existence of one such bird in our post-pliocene age was first declared in the year 1836 by Sir Richard Owen. His judgment was delivered upon a thigh bone, 13 inches long, from the Wellington Valley, so broken, crushed, and cased by its stony matrix that nothing could be said of it more than that it had belonged to a large bird of the Ostrich family. Thirty-three years subsequently Queensland yielded up from a well sunk on the Peak Downs another

struthious femur, and one sufficiently well preserved to enable Sir Richard Owen to discern its affinities and make it the subject of a memoir in the transactions of the Zoological Society of London for 1873. As the result of that examination the ancient bird of Australia was pronounced to be more nearly akin to the living Emu than to the extinct Moas of New Zealand, to which it had been previously referred by the late Mr. Krefft; and the enquiry so encouraged Sir Richard Owen in the opinion which he had long held, namely, that the struthious types of New Zealand had never extended to the adjacent islands, much less to the far away continent of Australia, that he added in a foot-note (Trans. Zool. Soc., vol. viii., pt. 6, 383) "I can now in 1872 repeat with more confidence the remark in my memoir of 1846, "no remnant of a Dinornis has yet been found in any of the contiguous islands, and I have in vain searched for such in the post-pliocene fossils of Australia." It appears to be beyond dispute that the bone which led Sir Richard Owen to maintain that the occurrence of a Dinornis in Australia would be so exceptional an extension of the New Zealand fauna as to be looked upon with doubt, does in its external characters more resemble a bone of the Emu, Dromœus, than of the Moa, Dinornis, but, in all diffidence, it may be questioned whether in naming this bird Dromornis, (Emu bird), the describer did not too greatly subordinate the important structural difference between the fossil bone and that of the Emu, the comparative absence of an air chamber in the former, for this certainly points to a lower grade of the whole bird economy, such as obtained in the Moas, but is left behind by the Emus. That the bird was not a Dinornis is quite clear, but that it was so foreign to Dinornis as to make it probable that Dinornis would never be found in Australia is not equally clear. However that may be, the palœontologist has ever since the discovery of Dromornis been expectant of other low forms of the Struthionidœ among the bird relics of our bone-bearing drifts, since it is hardly probable that so vast an area inhabited at the present time by at least three ostrich-like birds should in older and more prolific days have nurtured but one. It was therefore with more interest than surprise that part of a struthious femur was recognized in a collection of bones from King's Creek, presented to the Queensland Museum by Mr. J. Daniels, late of Pilton. Surprise, however, took the upper hand when, as the little adhering matrix was removed from the bone, Dinornine characteristics grew apparent. But it is not easy to rid ourselves at once of the preconception that a bone such as this is more likely to be third

example of the femur of Dromornis than anything else. It is therefore a matter of regret that a cast of the Dromornis femur cannot be placed, for purposes of comparison, beside the fossil under examination. The original is in the Sydney Museum, and Mr. Haswell courteously regrets that he has not a facsimile at command. However, in the figure given of it by its describer, we have a sufficient corrective to any bias in favour of its identity with the fossil before us. This bone is in much the same peculiar state of mineralization as the great majority of the Darling Downs fossils. It consists of somewhat more than the upper third of the left femur, minus the upper part of the head (h) and trochanter (t.ma.) These have been lost by abrasion while projecting above the surface of the creek bed. It measures five inches in breadth anteriorly from the head to the lower end of the great trochanter, four inches posteriorly from the head to the upper angle of the trochanter, and five inches externally across the trochanter. These are precisely the measurements yielded by a specimen of Dinornis crassus, *Owen*. The shaft, at its place of fracture, is rather more rounded than in D. crassus, measuring two inches two lines in breadth, and half an inch ten lines in fore and aft thickness. Its section is a full, irregular oval, as in D. elephantopus, very dissimilar to the pure oval of Dromornis, but somewhat less unlike that of the emu's femur, in which the inner side is rather more convex than the outer. The base of the head presents a strong annular constriction (a.c.) which, as in Dinornis, renders the head quite distinct from the neck (n.), and contrasts it with the subsessile heads of Dromœus and Dromornis. The depression for the ligamentum teres is in the emu scarcely perceptible, the ligament in this bird being attached to the centre of the almost continuously convex articular surface of the head; behind it a smooth concave tract slopes down towards the pneumatic foramen. In Dinornis crassus there is a subcentral pit nearer to the hinder part of the periphery of the head, and excavated to a moderate depth. In the fossil (L. ter.) it is in a similar position, but deeply sunken, and its hinder edge is raised into a rough ridge. In neither D. crassus nor in the fossil is there a concave slope behind the ligament pit. The neck (n) of our subject is distinctly longer and narrower than in D. crassus, and consequently more divergent in both respects from that of Dromœus. The neck at its junction with the epitrochanterian surface (ep. t.) is far more deeply hollowed than that in the emu, and therefore conspicuously unlike that of Dromornis, in

which the upper outline is nearly horizontal. The saddle so formed is in fact more deeply seated than in D. crassus. The outer surface of the trochanter (ect. t.) is nearly flat, devoid of the submarginal convexity shown in Dromœus, and the muscular attachments (m) are in two shallow depressions raised above the level of the bone by tubercular outgrowth, as in Dinornis, instead of into two excavations from the surface, separated by a bridge, as occurs in the emu. The mode of origin of the great trochanter of the fossil strongly resembles that of the moa—it rises abruptly from the shaft, and forms immediately a prominence, which curves over towards the inner aspect of the bone, and overlooks the markedly concave anterior surface between it and the head. In the subject of Sir R. Owen's figure of Dromornis the form of this surface is obscured by mutilation, but in the recent Dromœus it is comparatively flat and the trochanter rises from the shaft by a gradual and smoothly rounded increment; and it is only near its upper end that it forms a re-curved edge. The large air channel into the interior bone of the Emu, so intimately connected with the excursive habits of the typical birds, is wanting in all the fossils under consideration, but in the moa and in our fossil alike it is foreshadowed by three small foramina just beneath the hinder edge of the neck. Commensurate with these feeble means of communication with the outer air the internal chamber (*cav.*) is but feebly developed within the substance of the shaft. The linear dimensions of its section are less than a fourth of those of the whole section enclosing it. In Dinornis the lesser trochanter is hardly appreciable, it is represented by a mere thread on the surface of the shaft; in the Emu it is a well-developed outstanding ridge. The upper part (*t. mi.*) of this linea aspera, as it exists in the Moa, is preserved in the fossil. There is in Dinornis a large oval rugosity for muscular insertion nearly in the centre of the inner and concave surface between the head and the origin of the trochanter major (*t.ma.*) This feature also is very evidently repeated in the Australian fossil, whereas in the Emu we perceive but a faintly rough surface much nearer to the head. In an ordinary case it would have been sufficient to point out the several characters of the object under review in order that we might arrive at a judgment upon its systematic claims, but since those claims tend to modify the experience of the most eminent of modern palæontologists it is expedient that we should briefly revert to the grounds on which they appear to rest. The chief particulars in which the femur in question differs from that of Dromornis, are a long

sloping neck, constricted at its junction with the head, a full and irregularly oval shaft and a broad outer trochanterian surface. These are precisely the characters by which the corresponding part of the thigh bone of Dinornis is differentiated by Sir R. Owen from that of Dromornis, and in all of them our fossil agrees almost exactly with the femurs of D. crasus and D. elephantopus. It is needless to recapitulate its differences from Dromæus since the divergencies of Dromæus from Dromornis are but exaggerations of those of the latter from Dinornis. With Dinornis in direct comparison it agrees not only in the salient features referred to, but in most of its subordinate characters, for example, in the linear condition of the lesser trochanter, (*t. mi.*) and the three foramina beneath the hinder edge of the neck. At the same time our fossil has distinguishing marks of its own. Of similar dimensions to D. crassus and similar massive form to D. elephantopus it differs from the former sufficiently in its slenderer head and neck and deeper saddle between the head and trochanter, and from the latter abundantly in detailed measurements. These differences from its nearest allies taken in conjunction with its continental habitat, leave us, we may conclude, no alternative but to regard it as specifically distinct from any Dinornis on record. Its habitat emboldens us to propose for it the name D. Queenslandiæ not with any idea that it was a species restricted in its range to north-east Australia, but merely that the name, like that of Nototherium Victoriæ, may remind us of the colony that gave the first hint of its existence.

The moas have lived in New Zealand almost down to our own days, and the presence of Dromornis and Dinornis in Australia shows that on the main land this heavy-limbed branch of the struthious stock is comparatively ancient. It has, indeed, a molluscan longevity. It was a contemporary of fresh water shells which were here before the surface of the land was modernized, and are here now while we examine the feathers and tendons of the last of the moas. The Australian species were in all likelihood exterminated long ages ago, for we nowhere find their remains strewed and heaped on the surface, nor their destruction traceable to human agency. The absence of carnivorous mammals has been held sufficient to account for their longer survival in New Zealand, but how is that absence itself to be explained, more especially now that we find on the continent bones of Dinornis, Thylacinus, Sarcophilus, and of the dog lying in apparently the same drift. The migration of the beasts of prey was surely as easy as that of the sluggish, wingless birds.

Have New Zealand and Australia, or at least its eastern ranges, ever been parts of the same land, with a fauna like that of New Zealand? Geology is as yet far from favouring the supposition, which moreover would compel us to assign to the moas an enormous duration. We must await more light. Meanwhile it is not without interest that we see so distinct a breach open in the wall of exclusiveness surrounding the New Zealand fauna.

TUESDAY, 11TH MARCH, 1884.

THE VICE-PRESIDENT, J. BANCROFT, M.D., IN THE CHAIR.

DONATIONS.

"Transactions and Proceedings of the Royal Society of South Australia," vol. vi., Adelaide, 1883. From the Society.

"Journal and Proceedings of the Royal Society of New South Wales," vols. xiv., xv., xvi., Sydney, 1881-1883. From the Society.

The following papers were read:—

WATER SUPPLY: SPRINGS AND THEIR ORIGIN.

By JOHN FALCONER, C.E.

(PLATES V. to X.)

CLASS I.—Natural Springs caused by the inclination and dislocation of the Strata.

SPRINGS of this class exist in the Cape Colony, on the inner slopes of the Main Range (plate V. fig. 1) which is situated about the same distance from the sea as the Coast Ranges in this Colony. In the Cape of Good Hope the sedimentary rocks dip from the high table land in the interior of the Continent towards the Coast Range, and about one hundred miles from the top of this Range the formation commences to rise again, thereby damming the water back into the strata. Part of this water finds its way to the surface through dislocations at the change of inclination,

thereby supplying the Cape farmers with splendid springs, about twenty miles apart. The early Dutch settlers "Treyked" northward from spring to spring, as a Dutchman never thought of settling down where he could not get flowing water at some point above his homestead. Some of these springs are sufficient to drive two or three water mills, and they run through every street in their Townships.

This water has been tapped by boring in the interior over what is known as the "Great Karoo," and the water generally rises to the surface and sometimes overflows.

In some of these wells the material gone through consists of deposits similar to those found in the Western Downs of this Colony, near Roma. The depth of the Alluvial deposit overlying the Lacustrine shales, varies, but in every instance once through that into the cretaceous sandstones and coal measures water is a certainty. (Pl. vi., fig. 1.)

On the Western Plains of Queensland the rocks nearly all dip from the Main Range to the South-west, over which the water coming down the creeks travels at nearly right-angles to the outcrops and dip.

On a line drawn parallel to the top of the Main Range, and spurs, and about thirty miles distant from it, water may be struck at a depth of about two-hundred feet, measuring from the bottom of the alluvial deposit, due to erosion, which, in sinking wells, has been seldom taken into consideration.

Class II.—Springs of Volcanic Origin.

This description of spring, existing in Queensland, is due to the overflowing of liquid lava or basalt into the old water system of the Colony, the water now getting in round the lip or edge of the basin filled up, flows underneath in the old river beds between the lava and the original surface.

These springs exist all over Queensland, and their presence may be indicated by patches of red soil, or decomposed basalt. The "Hummocks" are opposed to the hollows or valleys in the bed rock and indicate nearly the original height of the lava plain, and they remain in consequence of having been more consolidated (and so less liable to subaerial denundation) by the extra weight due to the depth of the valley filled up; whilst the less consolidated deposited over the original ridges has disappeared by erosion. Thus it happens that in boring through the basalt in almost every case water has been found lying in the old river hollows. (Pl. vi., fig. 2.)

On Ban Ban station, in the Burnett district, there is a large spring of this character which flows under a basaltic plain twenty miles square. Between the Normanby River in the Cook district and Deep Creek, you have a spring also of the same description, with the exception that it bursts forth in the middle of the lava plain, and forms what are called the upper springs on the Palmer Road, repeating the operation twelve miles further down. The Toowoomba water supply is another instance, only that the old mouths of the spring are within two hundred yards of the old post office, and could have been opened out at a small expense. Wherever a patch of black soil occurs in a red soil country you have an old mouth of a spring now silted up.

In the neighbourhood of Bundaberg, and in several other places, springs of this class occur, due to a lava stream which started about Gayndah, flowing into and filling up the old bed of the Burnett River (Pl. vii.), and where the ancient watercourse existed you have now the celebrated Bingerra and Wangerra scrubs, under which a large quantity of water is found at a depth varying from forty to one hundred feet.

Springs of this kind exist at—Ban Ban, Burnett; Deep Creek, Cook; Toowoomba, Darling Downs; Helidon, Moreton; Highfields, Darling Downs; Barolin, Bundaberg; Wongerra, Bundaberg; Spring Creek, Logan; Springfield, on the old Cleveland Road; Allingham Creek, Nulla Nulla, 140 miles west of Townsville, where there are four strong running springs; Pandanus Creek, near Townsville; hot and soda springs on Byrne and Flinders; a large spring at Kilcragie, on the Burnett; Amby Downs, in the Maranoa District. Water may be found underneath the volcanic deposits which form Redland Bay, Wellington Point, Cleveland, Victoria Point, St. Helena, and Humpy Bong, in Moreton Bay.

There are two or three splendid permanent water-falls in the Cook District which must be included in this class.

Class III.—Springs Due to Faults or Dislocations.

An example of this kind of spring, which exists in every district in Queensland, is found in the neighbourhood of Bundaberg, due to a fault in the coal formation, about eighteen miles long with thirty-two feet of a drop to the east. This fault supplies the water to the springs in that neighbourhood. (Pl. viii. a, and viii. b.

On the sea-side of the Main Coast Range the rocks generally dip towards the sea, and the islands and coral reefs which

lie off the coast are the remains of a range which formed the eastern lip of a basin which is now Torres Straits. On a good many, and probably on all, of these islands good water may be obtained by boring into the strata, which dip towards the west. The large springs on the Lizard Island, and on No. 1 Howick Group, close to which Mrs. Watson and her baby died of thirst, are examples of springs supplied by the main land. The water accumulates between the strata coming out at the outcrop which forms the Barrier Reef. A good deal of this water, however, which gets in on the sea slopes of the Coast Range, bubbles up under the sea, as between Noosa and Double Island Point, or on the islands off the coast. The places where fresh water gains the surface beneath the sea are indicated by an immense growth of oysters and other shell-fish and coral, as life of this description seems to flourish best where the salt water is diluted. Where there is no coral, an an opening through the reef occurs, it is observed that the nearest head-land on the main-land is granite.

CLASS IV.—"BILLA-BONGS."

"Billa-Bongs" (Pl. ix.) are due to the water in its course along the beds of old channels, already filled in, being dammed back by the occurrence of natural barriers. These originate at times of periodical floods, when the surface water, in sweeping over the land, is charged with the smaller particles of loam which, by accumulation, form beds of impervious clay at points favoring their occurrence in these channels. The water being dammed back rises to the surface, and forms springs or water-holes, in which it is maintained at a constant level by the continuous supply from above. In the absence of springs of this description, driven tube wells will generally make these waters available on the surface, and have been very successfully applied in this country and Abyssinia.

Water exists at a depth of from twenty to fifty feet in all the Spinifex and Desert country.

On Wonaminda Station, Mitchell, a good sized creek looses itself in a gorge, and flows underground. It in all probability lodges somewhere between there and the southern border of the colony, and may supply the springs both hot and cold which appear at Cooper's Creek, and which have very likely formed the opal beds in that neighborhood, which appear to be only dried-up hot springs. This creek is highly charged with silica, and in eroding its way through the rock has lined the gorge with a coat-

ing of natural glass, some of which is of just the same composition as opal, and exhibits a somewhat similar play of colors.

All the Tidal Creeks may be dammed, so as to keep out the salt water and retain the fresh, and the water raised by appliances for irrigation, as was proposed to the land owners of Doughboy Creek fourteen years ago.

The remedy for the past state of things, the droughts so frequently experienced, lies in adopting the State-aid system, as in vogue in Scotland, enabling land owners to obtain money for special improvements on mortgage from the State.

PSEUDOMORPHISM IN MINERALS.

By H. F Wallmann.

In the course of an examination of the minerals in the Queensland museum special attention has been paid to those processes of decomposition which have resulted in pseudomorphism, and as it is a subject which, to judge from mineralogical reports, does not seem to have been studied in Australia, it has been thought desirable to invite the attention of the society to it by means of a few illustrations drawn from Queensland mining-fields. The present communication refers only to certain ores of copper occurring at the Cloncurry mines.

None of our waters, whether rain or spring, are the pure chemical combination H_2O—in its integrity it does not indeed exist in nature; natural water always contains in solution extraneous gases or solids derived from the atmosphere or the earth. The usual compounds introduced from these sources are carbonated alkalies, double carbonate of lime, magnesia, or iron oxides, silicates of alumina, common salt, and nearly always minute percentages of ammonia. Probably from the oxidizing action of electric discharges upon the last element small quantities of saltpetre and soda nitrate are also communicated.

One portion of the rainfall rises again immediately by evaporation to perpetuate the circulation of moisture. The other is more permanently absorbed and re-appears eventually as spring water. The latter portion in its passage downwards through clefts and fissures acts upon the materials in its path with forces which are irresistible. The most compact mineral and rock masses yield to the unceasing action maintained in its descent.

It is not the mere force of its pressure that is able to break up the obdurate resistance of compact limestone or quartz, or of even the glassy mass of obsidian or pitchstone, or of the beds of unctous clay; it is its constantly renewed impact, which, together with other causes, gradually increases the means of infiltration by the fissures, and at the same time intensifies the chemical disturbances which it commenced.

To this we trace the origin of all zeolites, and of most decomposition products, which subsequently appearing as specific minerals, are again liable to be similarly affected by that circulation of water to which their existence was due.

What wonder then that we find in the cavities of basalt the water-born zeolites—in nuggets of melaphyre amethyst, or in limestone caves the pendent stalactites.

But not to go out of our way to explain the various theories respecting the action of water on the rocks, we will turn at once to the phenomena of decomposition and recomposition which are illustrated by the minerals under notice.

Take first of these the cosmopolitan mineral, Cuprite or red oxide of copper, Cu_2O, with tesseral crystals appearing as cubes, octahedrons, dodecahedrons, or in combinations and twins after octahedrons. The colour is cherry, or different shades of red, the streak brownish red.

Next, a green mineral, Atacamite, a hydrous oxy-chloride of copper, HCu_2O_3Cl. The crystals are rhombic in short or long prisms. They occur in groups, and massive lamellar. The colour is different shades of green to blackish green. Translucent to semitransparent, with vitreous lustre and apple-green streak. The origin of this decomposition product of copper is briefly due to the action of rain or spring water holding chlorine or chlorides in solution. The tesseral Cu_2O passes by substitution into the rhombic $H_3Cu_2O_3Cl$, with a loss of hardness and specific gravity. Wherever there are copper ores and chloriferous water this reaction is to be expected, either complete or incipient, but near the surface or in the fissures of the ores.

A third product of alteration is Malachite, a hydrous carbonate of copper, $Cu_2CO_4 + H_2O$, of a green colour and with a green streak. The crystals are monocline, generally microcrystalline, needle or hair-like, in thin plates, racemose or kidney shaped, and the chemical composition is $72\ CuO\ \ 20\ CO_2 + 8\ H_2O$. Wherever copper occurs Malachite appears under the influence of the carbonates contained in air or water.

Again we have a blue mineral, also a hydrous carbonate of copper, namely: Azurite, $Cu_3 C_2 O_7 + H_2O$, with a streak like its colour—smalt blue. The crystals are monocline, in the form of thin plates, or short prisms, not seldom however in long prisms, mostly in tufts or groups, also in compact or earthy varieties. The chemical composition, is 69 CuO, 26 CO + 5 H_2O.

The minerals already mentioned are enough for our present purpose We may now consider the modes whereby a new compound is produced in the shape of another from the decomposition of which it has originated, that is of a pseudomorph, the accepted meaning of pseudomorph being a mineral occurring in a form which does not naturally belong to it, which form it has assumed by the gradual substitution of the atoms of another mineral by its own. Of this nature is the rhombic Atacamite or hydrous oxy-chloride of copper when it appears in the tesseral shape of cuprite, the red oxide of copper, in octahedrons and cubes. Here we appear to have cuprite crystals, with a green colour and a green streak; the red oxide is in fact substituted by the chloride. Not only do its tesseral crystals pass into atacamite, but they even renew the fine lustre of that mineral. In short it is atacamite in a false form. There can be no doubt that this change, or rather partial change, has been effected by interpenetration of chlorine in one state or another, among the molecules of the cuprite. On a larger scale, veins of atacamite are frequently to be seen penetrating the mass, and occupying fissures, or at least lines of least resistance, to reactionary force. Should the decomposing agent reach an open space in the substance of the mass, and meet there no crystalline form of the ore, it lines it with its own proper crystals, but if it there finds crystals of the oxide it removes them by slow degrees, replacing them by atacamite, and so producing a pseudomorph.

To have a clear idea of this class of pseudomorphism we must suppose changes resulting from the reception of new elements entering from within.

Specimens are met with having one portion of their cuprite crystals completely translated into atacamite, another in which the operation is not yet perfected, and another in which it has not yet commenced.

In another pseudomorph, however, we have proof that the direction of the agency of decomposition has been reversed. The blue hydrous carbonate of copper, azurite, with its prismatic crystals, beautiful blue tint, and transparency, are accompanied by crystals, some of which show partly the green colour of malachite,

others which have altogether passed into malachite. Not only are their peculiar colour and transparency lost, but the specific form of the crystals themselves is affected. Malachite appears in the form of azurite, one carbonate has the crystalline aspect of the other. Why? Simply as the result of a loss of carbon and a compensation of that loss by water and copper oxide; a process which goes on in the mass from without inwards.

In contrast with this latter action we may lastly notice two other and different effects of pseudomorphic causation.

In the first a covering of malachite is formed over crystals of cuprite. The encasing may be partial or entire. The cuprite form of crystal is retained and we have malachite in octahedrons, cubes, twins after octahedrons, and other forms of the system—a change of form, which is accompanied by an important loss of specific gravity. The pseudomorphs of this kind from Cloncurry are equal in size and beauty to those of Chessy, near Lyons, in France.

The second of this class of pseudomorph indicates the same process. Malachite covers and fills the crystal form of carbonate of iron, siderite.

These last two kinds of pseudomorph are indeed well known, but a notice of them appeared necessary to render our review of the various modes of pseudomorphism complete.

I have to thank the Trustees of the museum for permission to exhibit the specimens on which these observations are founded.

ON THE BOWEN CYCLONE OF 30 JANUARY, 1884.

By Mr. JAS. THORPE.

(Plate X.)

On 30th January last a storm of an unusually severe character passed over the portion of N. E. Australia near 20° S. and 148° E.

This storm was of a well-marked cyclonic character, and as it possessed some features peculiar to itself I have thought it worth while collecting what information was possible from various sources with reference thereto. The results I lay before you, together with chart showing, by the recorded variations of the

wind, the path of the storm's centre. By these aids you will perceive that it (the storm centre) passed inland from the sea in a direction nearly due west.

For some days previously a northerly wind had been blowing along the coast, changing during the night of the 26th and early morning of 27th to S., and so to S.E. during the 27th, 28th, 29th, and 30th, increasing in force to a gale, with very dirty weather. The northerly wind reasserted itself on the 30th.

The first shift of wind noted is from the log of the "Pearl," Queensland Government schooner, off Hook Island;—"Midnight, wind veering from S.E. to N.N.E. Hurricane." Between 6.30 and 9.30 a.m. the centre passed to the north of Bowen, the wind at that place shifting from S.E. to E. at the latter time, and blowing furiously. Continuing its westward course, the centre passed to the south of Cape Upstart between noon and 1 p.m. The "Catherine Jane" had been beached in Upstart Bay early in the morning, Wind S.W.; heavy gale. Captain French says:—"At 12.30 p.m. for twenty minutes there was a flat calm, then suddenly the wind sprang up from the opposite side of the compass, and blew stronger than ever."

The Ayr reports give wind directions as —8 a.m. W.; 2 p.m. N.W.; 4 p.m. N. Finally, at 9 p.m., the cyclone had dissipated itself over the country to the west of Ravenswood.

I append an account of the storm as felt at Poole Island in Edgecombe Bay, and extracts from other public and private sources serving to show its exceptional severity. With regard to Mr. Christison's account of the course of events at Poole Island, his experience is exceptionally interesting, inasmuch as he shows a further veering of the wind from N.E. to a point west of north. The same fact shows in the Dent Island report, a light station on the coast about forty miles W.S.W. of Poole Island. This can be accounted for by what we may term a subsidiary depression on the outer edge of the main one. The barometer gave very little warning at Bowen of the coming storm. It had been falling gradually during the early morning, but not until the centre was nearly due north of that town did the mercury fall rapidly, and then it fell ·25in. in an hour. I am unable, for various reasons, to give readings useful for comparison from other stations. At Cape Upstart, a little to the north of centre, readings are taken at 9 a.m. and 3 p.m. At 9 a.m. the centre was to the east, and at 3 p.m. to the west of the station, thus the minimum reading about noon is not registered. At Cape Cleveland the same. At Townsville the official record shows no trace of the passage

of the cyclone either in barometer, wind, or rain columns. This record is valueless. At Biralee on the Bowen River "the wind was S.E., gusty, never approaching a gale."

The barometer (aneroid) on board the "Fiado" at Bowen, at 9.30 a.m., registered 28.50 inches; on board the "Maranoa," at Flat Top Island, 30.29 inches—a difference of nearly an inch and three-quarters in 130 miles, and presuming that the readings require little or no corrections, this gives a resulting gradient of 80, steep enough to account for the exceptional severity of the gale.

A peculiar phosphorescent appearance was noted from Bowen, and also from Poole Island. (See appendix.)

As to the cause of this cyclone I am unable to do more than speculate. Probably it had its origin not far from the coast. We see on the coast north of Bowen a disposition to northerly winds; south of Bowen, a south-east gale. Where these opposing currents meet a gyratory movement is set up, intensified by the force of the wind itself. The northerly wind, in this case, remained master of the situation, the south-east gale changing away into E.N.E., N.E., and N., sending the eddy whirling away inland, instead of (as the theory of cyclones would lead us to expect) recurving on the coast, and going off in a south-easterly direction. The actual rate of progression of the centre of depression westward was about ten or twelve miles an hour. The actual force of wind can only be judged of by its effects, even had there been an anemometer available at the beginning of the storm (which there was not; in fact, I suppose there is not more than one in the colony), it would not have been there when the storm ceased.

I have to thank Captain Wyborn and the Assistant Superintendent of Telegraphs, Bowen, Mr. R. O. Bourne, for the assistance they have rendered me.

The wind and weather symbols in the Appendix are according to the Beaufort scale.

APPENDIX.

Stations to North of Cyclone's Path.

Cairns.—16th to 26th, northerly winds. 27th to 29th, south-east winds. 30th and 31st, northerly winds and fine weather.

Cape Cleveland.—17th to 26th, northerly winds and fine weather. 27th to 29th, south-easterly winds and fine weather.

30th, 9 a.m.	S. W.	7	p. q.	29.70	80
3 p.m.	W. S. W.	4	m. d.	29.90	83
9 p.m.	N. W.	5	m. p.	29.96	77

Misty, and passing showers. 31st, northerly wind, rain, thunder, and lightning.

Cape Bowling Green.—17th to 26th, northerly winds and fine weather. 27th to 29th, easterly winds, dull.

29th, 9 p.m.	S. W.	5	g.
30th. 7 a.m.	S. W.	9	q. r.
11 a.m.	S. W.	10	q. r.
1 p.m.	W.	11	q. r.
7 p.m.	N.	6	r. t. l.

Winds south-west to north, force, 6 to 11 all day, whole gale; heavy squalls at intervals, thunder and lightning at night. 31st, northerly winds, unsettled weather.

Cape Upstart.—17th to 26th, northerly winds. 27th to 29th, easterly winds.

29th 9 p.m.	S.W.	strong	30·08	u. g. m.
30th 7 a.m.	S,W.	,,	29·75	q. r.
3 p.m.	W.	,,	29·85	q. r.
9 p.m.	N.	,,	30·00	r. t. l.

Heavy squalls, with thunder and lightning. 31st northerly wind, unsettled weather

Ayr.—Cyclone commenced at 5 a.m, wind from west, increasing till 2 p.m., when wind veered to north-west. At 4 p.m. the wind veered to north and gradually abated.

Stations to the South of Cyclone's Path.

Extract from Private Letter from Bowen.—"On the Tuesday, 29th, the wind was very strong from the south-east. The sky had a leaden appearance, which I did not like, and I referred very frequently to my barometer, one of Fitzroy's Storm Barometers (mercurial), also an aneroid which is adjusted to it. Much to my surprise the mercury went up slightly and stood about 30·4, about ·2 above its average, the wind freshened about 11 p.m., when I went down to the beach to see after our boat, the glass still same. Wind blew hard all night, during which time some buildings fell; at 5 a.m. I got up to have a look at things, found glass still same, verandahs were then flying freely. At about 6.30 the glass commenced to fall rapidly, and in less than half-an-hour stood with me at 29·4, but this was too late for any warning, for the wind came at same time, and all went before it, just like a pack of cards in a breeze; the wind to 9.30 was south-east, and then shifted to east, and blew with additional force, for it was then that most large buildings fell, those which had gone earlier were only light ones; this lasted for three-quarters of an hour, the wind veered to the north-east, and blew with less force until noon, when it fell off to a strong breeze; the mercury rose about 11 a.m. and went up until noon, when it stood at 30·00. The storm then followed the direction of telegraph line from here to Clare, 73 miles, and swept line before it, broke forty poles off level with the ground, and blew out numbers of others. Strange to say, on my inquiring how poles leaned from here to Clare, line being nearly east and west, they say one mile is leaning one way to north, and the next to the south. The storm struck Clare at noon, and then came from the south-west (mind, I do not vouch for points of compass, except Bowen), but it must have been near that, because it blew the old telegraph office on the western side into new office, and then there was a smash. At Ravenswood storm seemed to have begun at 10 a.m., but maximum at 3.30 p.m., or three hours later than Clare. Wind south and south-west. This is 30 miles south of Clare. At Ayr, 20 miles north of Clare, they are said to have got it from north-west,

the maximum about 4 p.m.; duration, 8 a.m. to 6 p.m. I cannot give you any other barometer readings. The captain of "Fiado" steamer, which broke her cable with 150 fathoms out, and came on the beach, complained to me of the uselessness of his aneroid, for the wind came before it moved, and that was my experience."

"FIADO," S.S.—Captain Ennis forwards the following readings corroborating above, but differing slightly from the Pilot Station and Poole Island reports, below:

30th, 6.30 a.m. 29·4 S.E. hurricane, barometer, (aneroid) falling rapidly.

9.30 a.m. 28·5 S.E. changing rapidly to N.E.; min., barometer reading.

11 a.m. 30·0 N.E. gale moderating.

No N.W. wind or even N., it remaining to E. of N.

PILOT STATION, PORT DENISON.—27th to 29th, south-east wind. 29th 10 p.m. Sea had a very bright phosphorescent appearance, like as if on fire, or that the light of day was breaking upon it; this continued until 3 a.m. 30th, when it gradually disappeared. The barometer fell gradually until 9 a.m. on 30th, after which it fell suddenly.

30th 9 a.m.	S.S.E.	12	o. r. q.	29·30	74
10 a.m.				29·06	
3 p.m.	E.	11	o. r. t.	29·40	
9 p.m.	N.E.	10	o. r. t. l.	29·62	

31st, northerly wind. Barometer gradually rising,

Queensland Government schooner "Pearl," Jan. 29th, morning, S.E. by S.; midnight S.E. by E. to N.N.E. hurricane; off Hook Island.

30th, morning, E.N.E. gale; afternoon, N.N.E. gale; off Dent Island.

31st, all directions between E. and N. Feb. 1st, N.N.E., 2 p.m. by N. to N.W.

POOLE ISLAND, EDGECOMBE BAY.—29th, 10 p.m. "An ominous silence proclaimed a change from the northerly weather which had prevailed for some time past. It lasted but a short time, when a strong wind arose from a point S. 25° W., increasing in velocity and pursuing a complete circle. When it reached S 45° E. about 1 a.m. 30th, it blew with terrific violence. Two miles out at sea, forming two-thirds of a circle, there appeared a continuous phosphorescent light, very brilliant, * * * as day broke the wind veered to N. 20° W., leaving but a small space to complete the circle. The cyclone was at its height from daylight till noon * * Rocks of tons weight disappeared from their beds, and stones fully 100 lbs weight were thrown in masses 30 feet high.

DENT ISLAND.—16th to 26th, northerly winds. 27th to 29th, south-easterly.

30th, 6 a.m.	S.S.E.	9	o. g. q. r.	75

6 to 9 a.m., wind baffling between S.E. and N.E., causing heavy sea.

12 noon	N.	5	o. g. r.	77
6 p.m.	N.W.	3		

31st, north-westerly winds.

S. S. "MARANOA," FLAT-TOP ISLAND.—29th, 6.15 p.m., strong south east gale all day. S.E., terrific squalls all night; two anchors down, and ship having to steam to her anchors.

30th, noon, wind veered to E.N.E., violent gale and blinding rain. Midnight, same, with thunder and lightning.

31st, gradually moderated. The barometer during the whole time only ranged 6-100ths, namely 30·24 in. to 30·18 in.

CERATODUS FORSTERI POST-PLIOCENE.

By C. W. De Vis.

The story of the Ceratodus, destined to close in Australia, opens in other lands and far bygone times. There is indeed an interest peculiarly our own in the pages of its record, for Queensland alone has been able to preserve in life the sole and probably the last descendant of its ancient race. But the first appearance of this strange lung-breathing fish was in the beginning of the middle ages—the mediæval era, so far as is known, of terrestrial life. It lived during the deposition of the mesozoic beds from the Keuper to the Oolite inclusive, and in the care of these sediments left occasional traces of the few forms in which it existed, then to all appearances it died out abruptly. The relics it gave to the rocks were by the nature of its organization rendered obscure and enigmatical, they consisted merely of bodies of one kind so strangely fashioned as to require all the ichthylogical skill of an Agassiz to enable him to identify them as fish organs. He pronounced them to be teeth or rather dental plates, armed on their edges with horn-like projections, and, moved by the resemblance, he named the creature of whose personality they had formed part Ceratodus or 'horned-tooth.'

Unfortunately the specimens at the command of the great ichthyologist were but few in number, more unfortunately scarcely two of them were sufficiently alike to allow him to refer them to the same species; the necessary result was that he established almost as many names as he had examples. Shortly a greater body of materials was brought together in public and private collections, and the fact then became apparent that to continue to give to each different form a distinctive name would end in a reductio ad absurdum, for almost every individual would constitute a species. Observers were therefore forced to the conclusion that whatever the number of species might actually be, the individuals of each differed excessively in the form of their dental plates. Of many hundreds of specimens the majority were believed (and probably, rightly believed) by Professor Miall, their monographer, to belong to a single species, which he aptly named polymorphus: the rest were

grouped under at most three or four other specific names. Beyond some surprisingly accurate conjectures of Agassiz respecting the structure, habits, and rank in life of their possessor, no knowledge of their life history was obtained, and it seemed as though nothing further could be known, for as none of the littoral beds subsequent to the deep-sea deposits of chalk yielded a trace of its continuance, the genus was naturally conceived to be extinct. Being extinct it should according to all rule geological never have reappeared, but as if to warn us that a law whose sanction depends on future experience is but a law on sufferance, the fish after a term of oblivion measured by the deposition of the Cretaceous and Tertiary beds in all their enormous thickness, variety of conditions, and time consumption, is found lingering in two small rivers at the furthest remove from its original habitats. We are here reminded strongly of a case extremely and very interestingly analogous to that of Ceratodus. In the oolite and chalk rocks everywhere a genus of shells, Trigonia, occurs in specific and individual abundance, so much so, indeed, as to give to certain beds a name and character. But beyond the limits of the mesozoic strata Trigonia never appears in the older known parts of the world. It was therefore much to the surprise of geologists that Trigonias were in the course of research found still living in tropical seas, notably in those of Australia. In this case, indeed, the gap has been largely bridged, and the wonder diminished, by subsequent discoveries of Trigonias in the Pliocene and Miocene beds of Australia. And so it may happen with Ceratodus, for living in the interval of time it must have been, for living it is now, to declare emphatically the imperfection of the geological record. Living in the interval of space it most probably has been, for it has been discovered in the secondary rocks of Asia as well as Europe. But curiosity is not satisfied with the bare inevitable, or the bare probable, we want to know where and how it has maintained its geological existence; has it always been the companion of marsupial life as it was in the beginning, and is now at its end? Have the marsupial and the fish always lived together in Australia, as would seem to be suggested by the prevalence of oolitic characters in the Australian fauna, or have they perforce, terminated on our shores their slow retrocession before the adverse influences which have rendered each step in succession baneful to them? These are questions for the geologist to answer: the first of them for the Queensland geologist especially. For that answer I fear we must wait till the due distinction is made amongst us between geology and mining survey, and our geological staff

is employed on its proper work. Meanwhile though the rocks are silent their modern detritus has given some response to the question. Remains of Ceradotus have appeared in the post-pliocene drifts of the Darling Downs, and we now know that the fish inhabited the waters of Queensland before the present systems of its watersheds were established: that is, before changes, whether of surface levels or climate, had laid dry the area now traversed by the Condamine, and drained the swamps and lakes left for a time upon its basin. Protected by its aquatic surroundings from the full force of the new influences to which most of the land animals of the period succumbed, the Ceratodus saw them perish, but its survival was in those only of the present waters to which it had access, and which remained suitable to it: it was lost to those now running south, and to those which form the southern head of the Fitzroy; it remained in, or entered those only of the Mary and Burnett. To account for its presence in these rivers, we must suppose one of two things: either while still living in the Condamine area under the old arrangements of surface, its range was extended to that drained by the rivers mentioned by some of the known or unknown modes of distribution, or there ensued from some geological agency a solution of the continuity of the water area accupied by its then wider habitat. The question must remain open until the geologist has determined the date of the upheaval of the Bunya Range, so called, or of the filling up of its passes by basaltic overflows. The fact originating the question is that the Ceratodus, that is the living one, C. Fosteri, once existed in the Condamine: the proof of this must now be offered. Some years ago a tooth of Ceratodus, obtained from the Darling Downs, was submitted to the late Mr. Krefft. It was apparently so different to the teeth of the living species that Mr. Krefft regarded it as new and gave it the name of C. Palmeri, but, as I am assured, published no description of it; a notice of it, however, accompanied by a cast, was communicated to *Nature*, Feb. 12, 1874, p. 292. During the last year the collectors employed by the Trustees of the Queensland Museum obtained several other examples from the Chinchilla conglomerate in which they are associated with remains of crocodiles, turtles, &c. These are the specimens before the society and among them is the type of Mr. Krefft's C. Palmeri. It will be remembered that the Mesozoic teeth are in every character extremely variable, and the recent acquisitions fully maintain the family peculiarity, no two are alike in detail: but just as among the diversities presented by the fossil polymorphus we discern a general resemblance sufficient for their collection in one

specific form, so in the examples before us we can perceive an approximate similarity in their leading features which enables us to avoid the error of considering them all of different species and leads us to regard them as not only one, but one with the living C. Fosteri. They consist of four pterygopalatine plates and five mandibulary: of the pterygopalatine of the upper jaw, one of the left side is pretty complete, retaining the greater part of its pterygoid element and the basal portion of the process for articulation with the frontal cartilage, the utmost difference it presents from the recent bone is the more forward position of that process, which rises opposite the second anterior tooth instead of opposite the interval between the second and third: the contour of the inner edge of the dental is a continuous curve, as in the recent fish. The surface of the plate in this specimen is nearly smooth, but in the very young one accompanying it the surface is even more pitted than its living exemplar. The two largest of the mandibulary plates must have belonged to fish of considerable size, that is, about four feet long, their plates are rather more elongated than in the living fish, and consequently, less curved on the inner edge. In the best preserved the symphysial and angular elements are retained in much completeness. It is useless to dwell on the minute differences they show amongst themselves, and when compared with the recent specimen. Suffice it to say that after due consideration of the value to be given to the dissimilarities, we must arrive at the conclusion that one and all belonged to ancestors of the present species, C. Fosteri.

A. Muir & Co., Printers, 208, Queen Street, Brisbane.

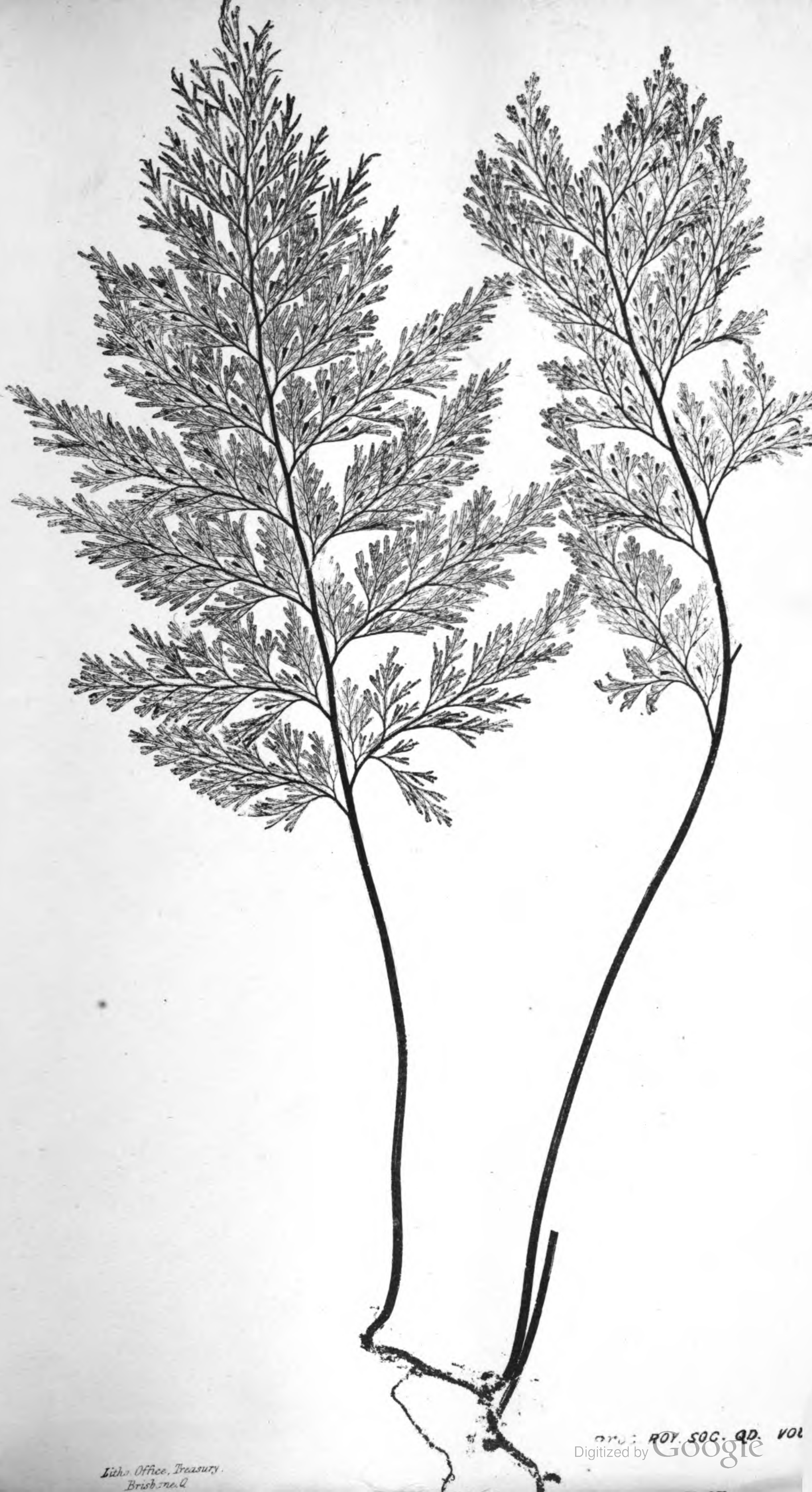

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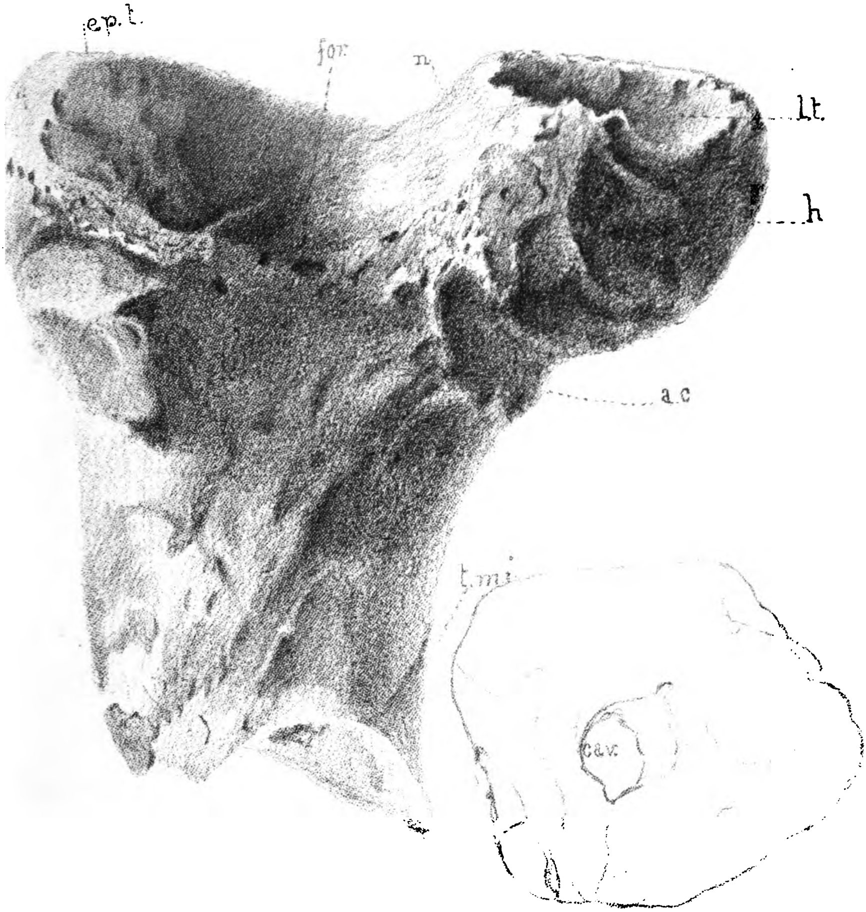
Plate III



Dinornis Queenslandiæ.

...nor delt

Plate IV.

J. Conner del.t

Dinornis Queenslandiæ.

Proc. Roy. Soc. Qd. Vol I. Pt I.

Plate V.

Africa

fig. 1

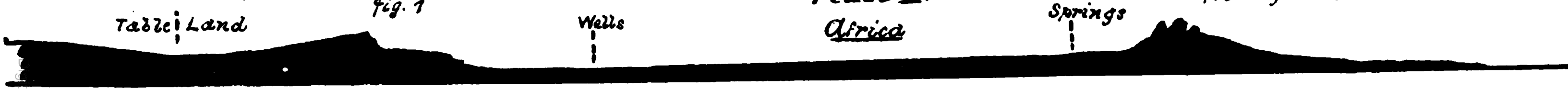
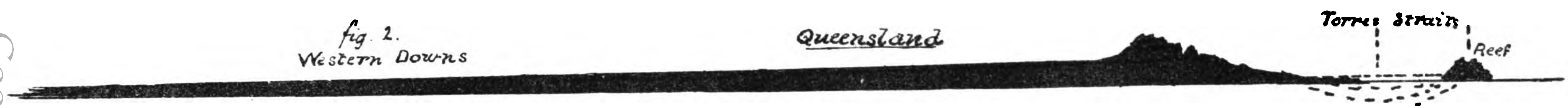


fig. 2.

Queensland



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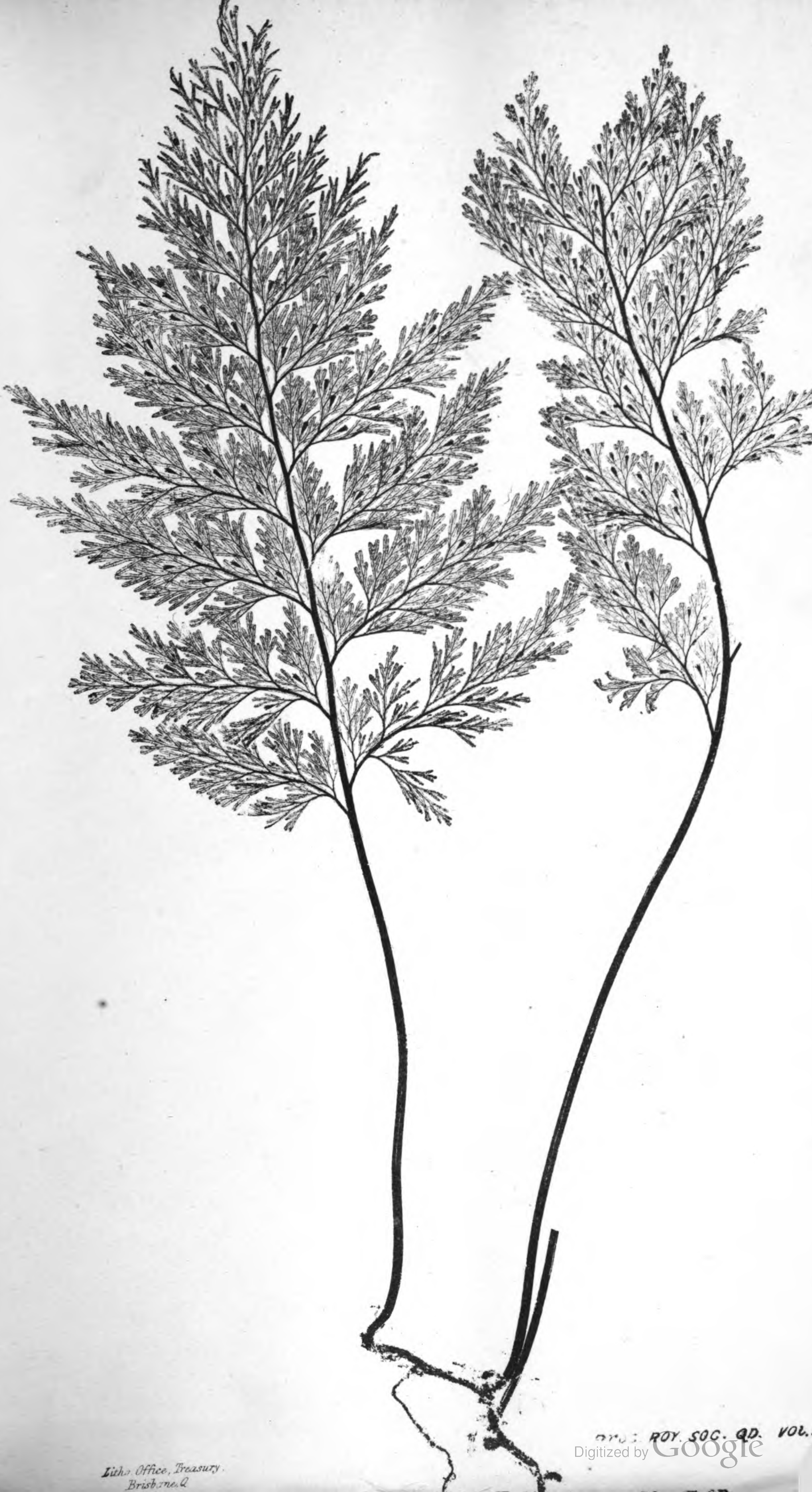

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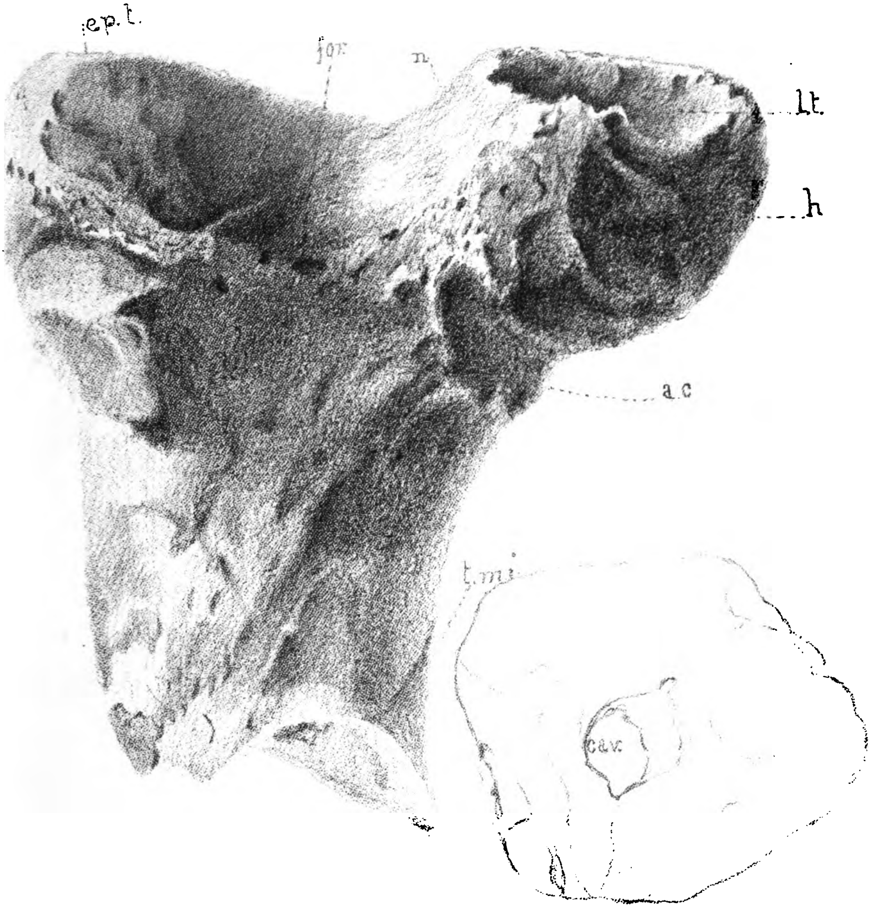
Brisbane, Q.

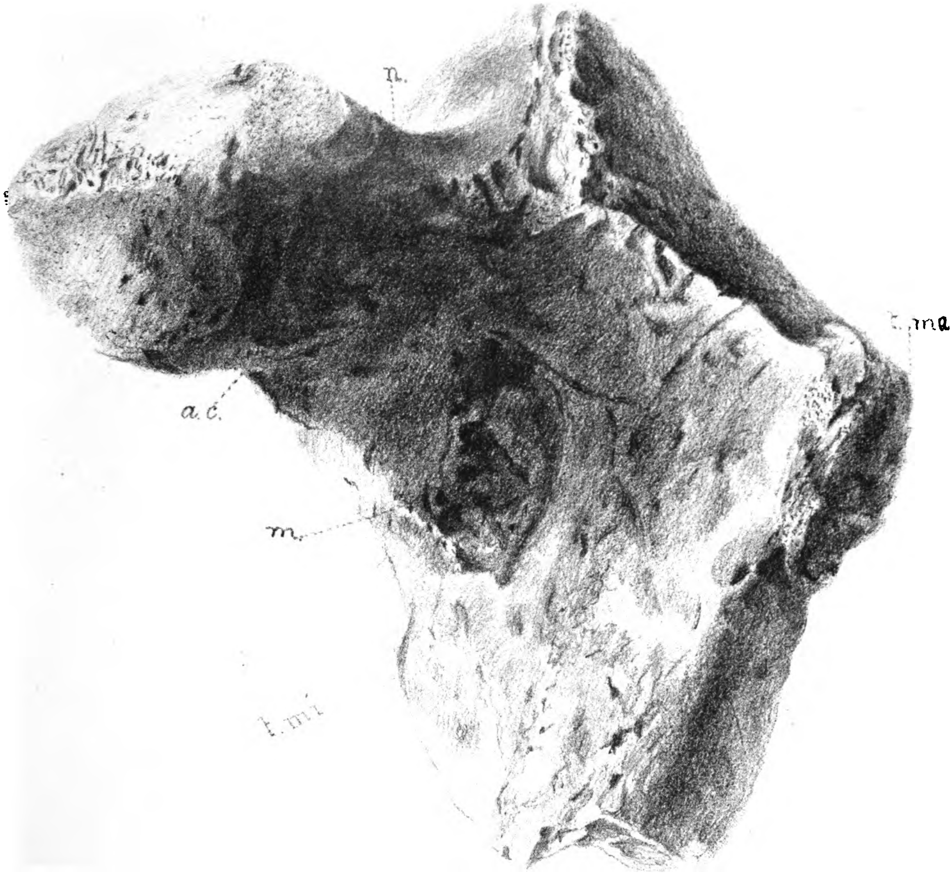
Plate III



Dinornis Queenslandiæ.

..nor del.t

Plate IV.



.. Connor del.

Dinornis Queenslandiæ.

Plate IV.

J. Hornet del.t

Dinornis Queenslandiæ.

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Plate II.

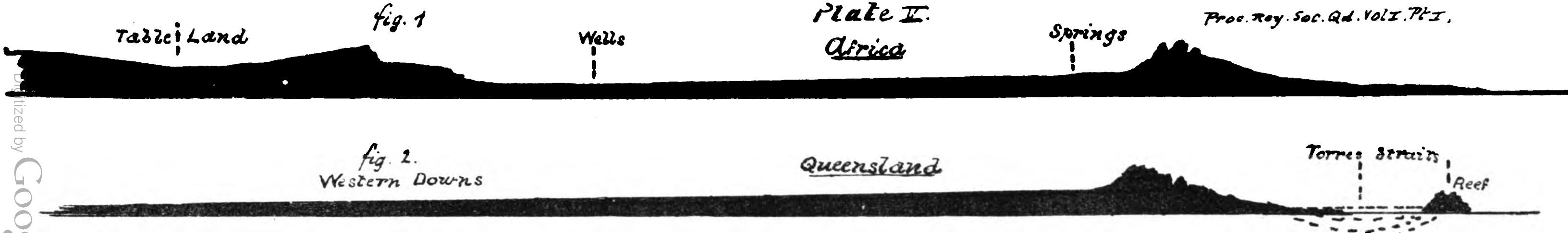

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PLATE VI

fig. 1

Spring in Down Country

CLASS 1

fig 2

Original height of Lava

Spring in Volcanic Country

CLASS 2

J. Falconer. delt

PLATE VI

Proc. Roy. Soc. Qd. Vol I. Pt I.

fig. 1

Spring in Down Country

CLASS 1

fig 2

Original height of Lava

Spring in Volcanic Country

CLASS 2

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LAVA STREAM

PLATE VII

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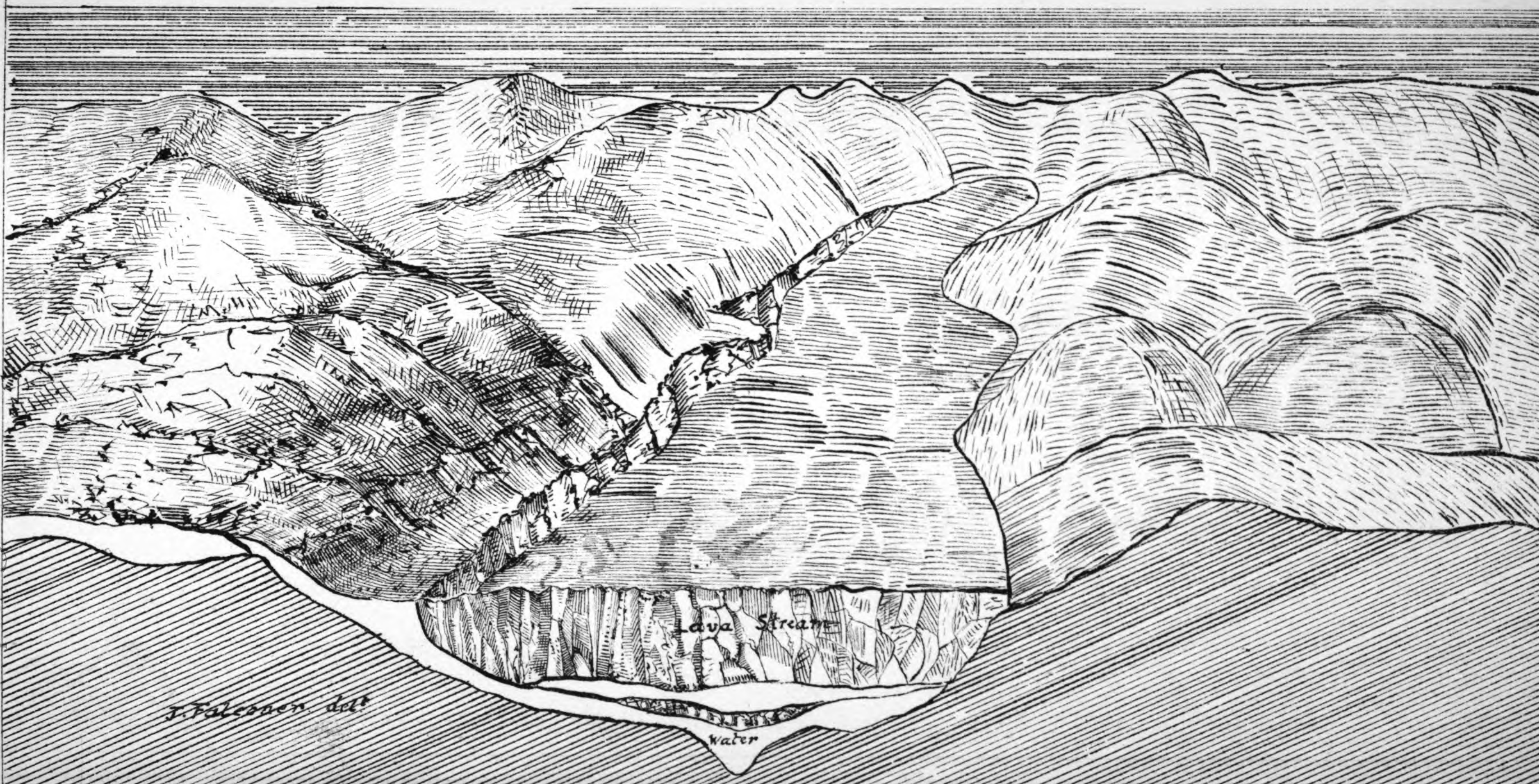

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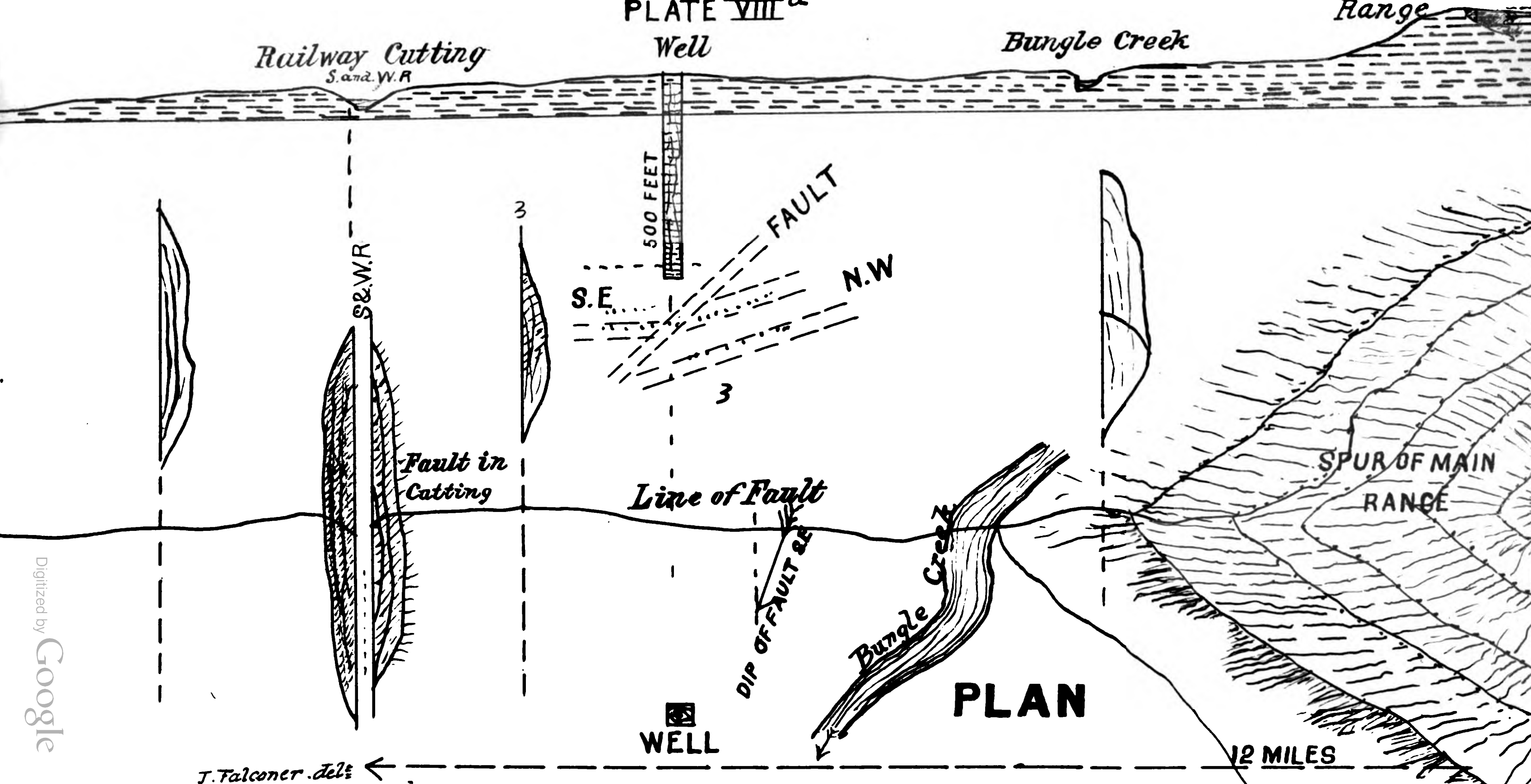
SECTION ON LINE OF FAULT

PLATE VIII a



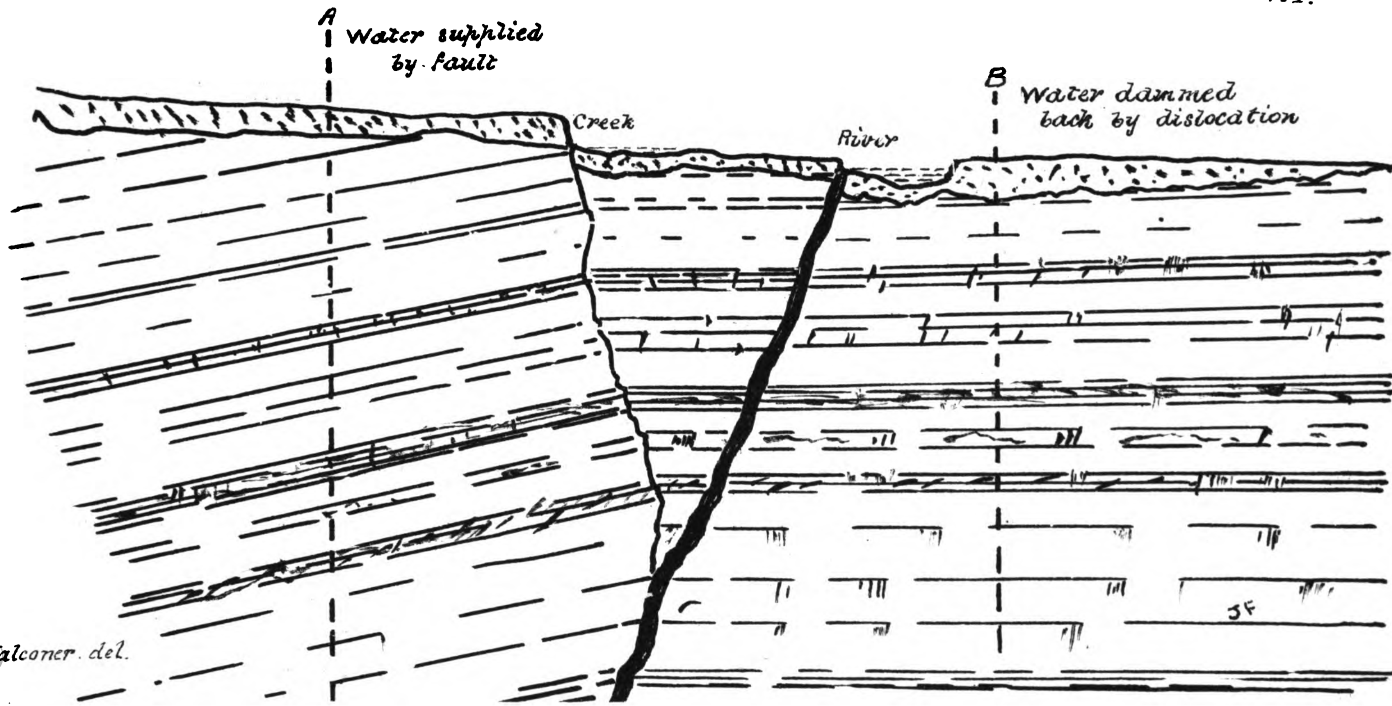
J. Falconer. del.

SKETCH OF A WELL WHICH DID NOT STRIKE WATER AND THE PROBABLE CAUSE

PLATE VIII b

Sketch of a Dislocation

Proc. Roy. Soc. Qd. Vol. X. Pt. I.

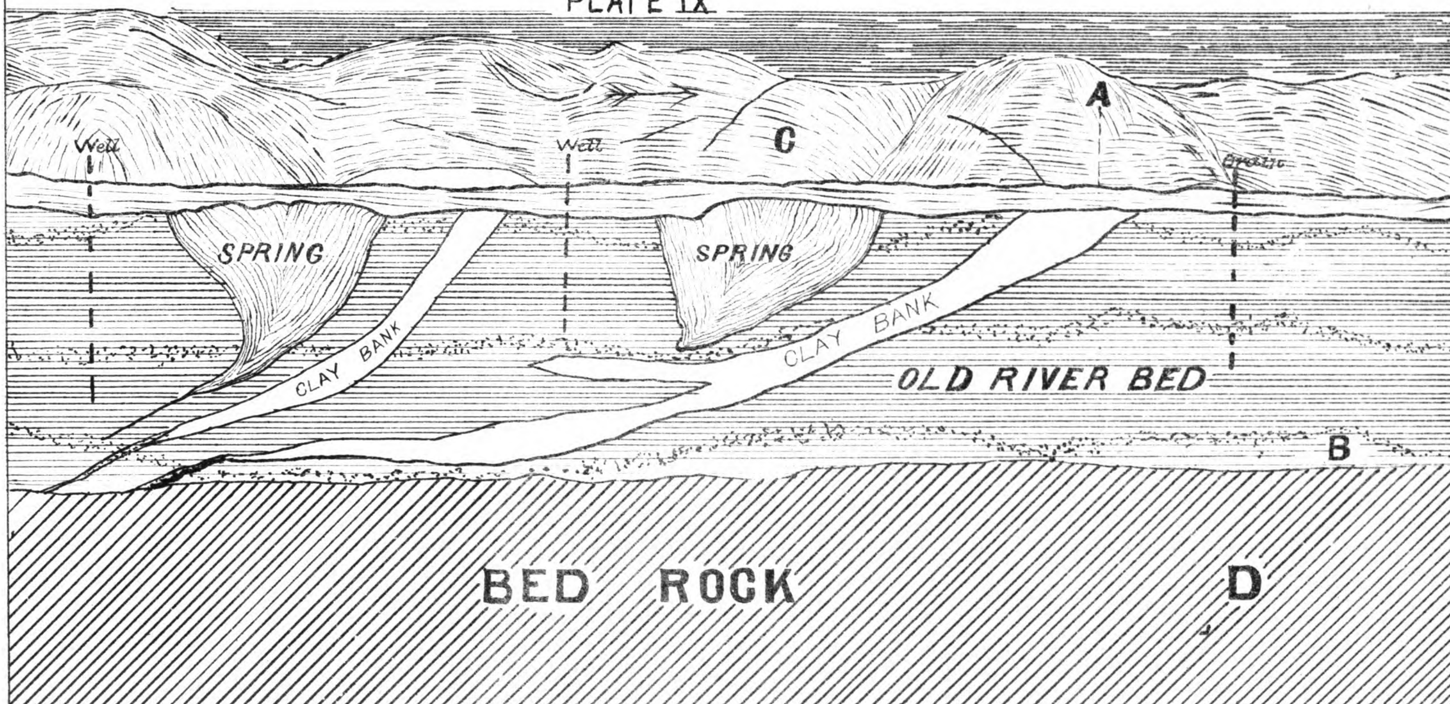


J. Falconer. del.

Proc. Roy. Soc. Qd. Vol. 1 Pt. 1.

BILLABONGS

PLATE IX

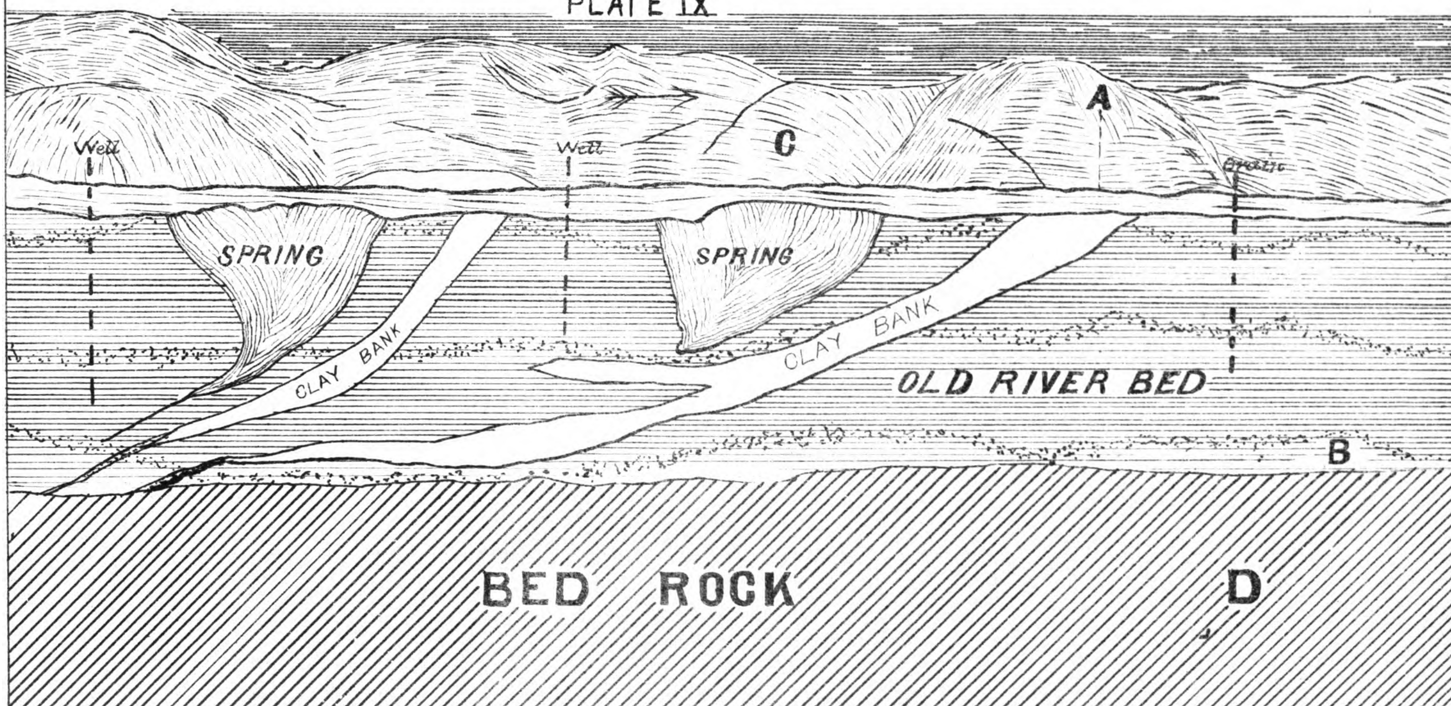


J. Falconer del.

Proc. Roy. Soc. Qd. Vol. 1. Pt. 1.

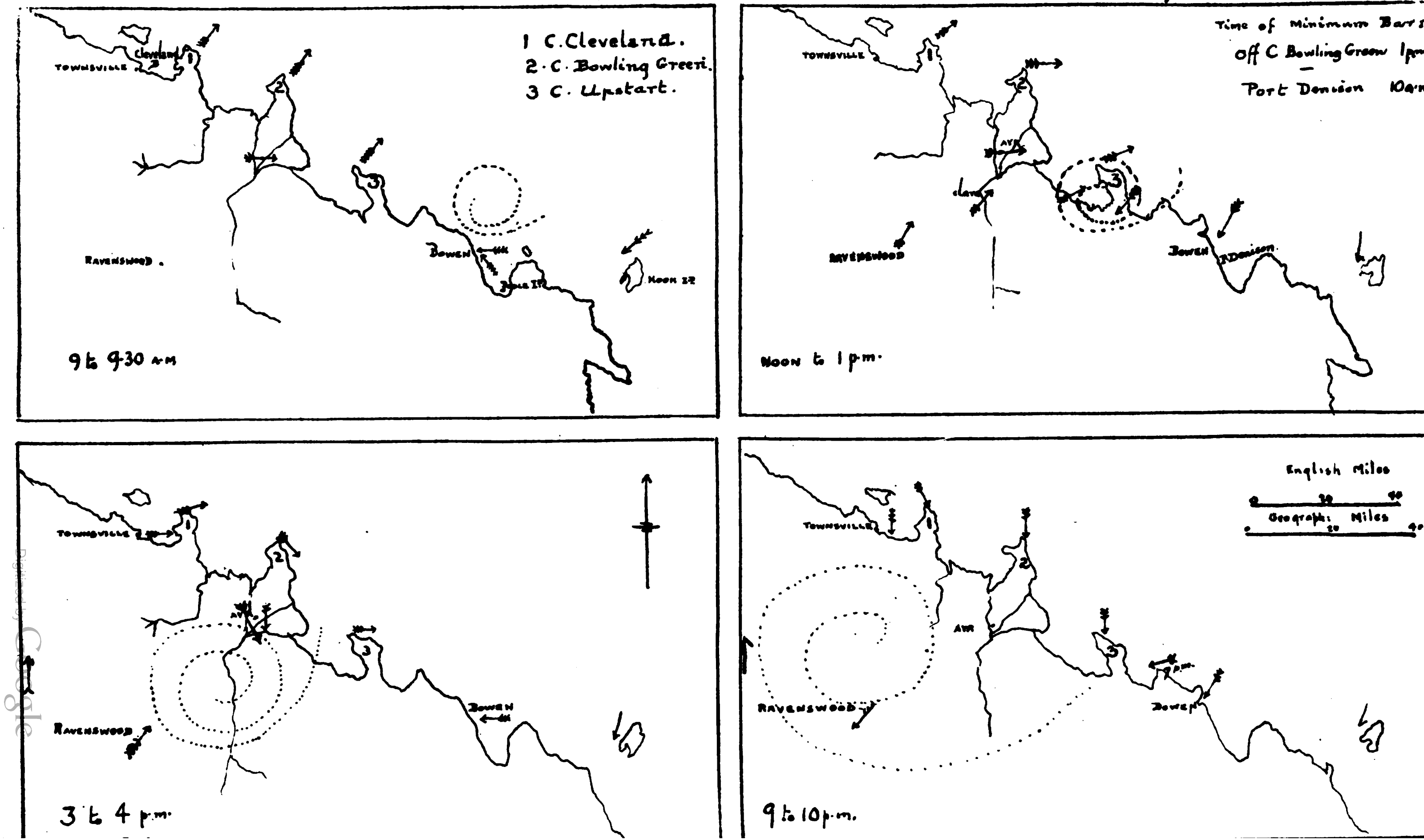
BILLABONGS

PLATE IX



J. Falconer del.

Charts showing path of cyclone · 30th January 1884 Pl. X. Proc. Roy. Soc. Qd. Vol I. Pt I.



CONTENTS OF VOL I. PART I.

THE

PROCEEDINGS

OF THE

ROYAL SOCIETY

OF

QUEENSLAND.

1884.

VOL. I. PART II.

Brisbane:
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Royal Society of Queensland.

The Monthly Meeting of the Society was held on Tuesday, 8th of April, 1884. The Vice-President, J. Bancroft, Esq., M.D., in the chair.

The following papers were read:—

ON AN UNDESCRIBED CLASS OF ROCK DRAWINGS OF ABORIGINES IN QUEENSLAND.

By Henry Tryon.

Plates (XI—XIII).

These rock drawings, or rather rock engravings to which my attention has been called by Mr. Philp of Haddon, are on the right bank of Pigeon Creek, along the bridle path leading from Tenthill to Pilton, near where it emerges from the scrub to ascend the main range. This track to the Darling Downs, which has only been known to the settlers for a few years, formerly served as a means of retreat for the blacks, in escaping from raids made upon them by the colonists; and they could rest secure in the mountain fastnesses through which it conducted, hunting meanwhile the game which to this day is here so abundant. The neighbourhood knows the blacks no more, and an attentive observer can meet but few indications of their former occupancy.

An outcrop of the sandstone, which, of similar age to the Hawkesbury series perhaps, largely contributes to form the Main Range of Southern Queensland, has here given rise to a cave or rather rock-shelter, and it is on its flat perpendicular wall that the figures have been delineated.

On my visit I found the face of the wall of this rock-shelter, having an extension of 18 feet in one aspect and 6 feet in the other, from the ground upwards to the height of a black of ordinary stature, completely covered with various figures cut in the hard

sandstone rock. The floor was entirely hidden by a considerable quantity of fine wood ash, but without further evidences of fire. No smoke discoloration on the walls, which however, were covered by that fine algaceous growth which effects the slow weathering of sandstone rocks in similar situations, everything in fact was invested in a garb of comparative antiquity.

The inscriptions are in some cases mere shallow depressions, plainly traceable when viewed in a proper light, whilst others are deeply scored in the rock, occasionally to the depth of an inch. Scattered throughout them are numerous drilled holes of different size and varying depth, some 1 inch deep, and several 1 to 2½ inches in circumference, some of which appear to have no relation with the grooved figures, whilst others are so grouped as to form figures themselves. Seldom the grooved figures have been evidently preceded in construction by series of drilled holes.

That they are the works of an auctothonous or indigenous people may, I think, be taken for granted.

An examination of the figures (Pl. XI) plainly shows that they are not the fruits of idleness, that they are not imitative symbols for mammals, birds, reptiles, or fish, &c., but insomuch as they conform to a limited number of types, the same figure occuring several times over, they may be conventional symbols for natural objects. "The natives have conventional forms for trees, lakes, and streams, and in transmitting information to friends in remote tribes they use conventional forms, but in many cases modified," (Brough Smith "The Aborigines of Victoria," Melb. 1878, vol. 1, page 285). Their "message sticks" may also be adduced in support of this opinion.

The ashes before alluded to, of sufficient quantity to fill a large cart, yielded on examination some remnants of previous feasting—bones of various animals still living in the neighbourhood, a few pieces of charred wood, fragments of sandstone from the rock above, and what is especially interesting several rude flint implements. (Appendix.)

Examples of indigenous native art are by no means uncommon in Australia, even if we limit our view to "rock drawings" as they are commonly called. From the time of Collins ("Account of the English Colony in New South Wales," 1804, page 381) onwards, the subject has been frequently discussed in the works of our explorers, and elsewhere; and Brough Smith has sufficiently summarised these notices in his work previously alluded to, (Op. Cit. vol. 1, Pg. 283) dwelling more particularly on Grey's narrative concerning the wonderful drawings or rather paintings met with by this explorer during his Western Australian Expedition, which to

some are evidences of a higher civilization than the Australian natives have otherwise ever exhibited.*

Almost without exception these descriptions have reference to rock paintings proper, and have this character in common in that they represent with more or less fidelity easily recognised objects, indeed some of their figures the outstretched hand for example, are repeated throughout the Continent.

In reference to another class of native delineations, inscriptions of the rudest type engraved in the rock itself. These are found throughout the world, and are especially numerous in the United States and South America. Their origin is assigned by the denizens of the localities where they exist, almost without exception, to a mythical source. It is to similar productions that Alexander Humboldt refers as occuring in the Savanahas, bounded by the Cassiquaire, the Atabapo, the Orinoco and the Rio Negro, "attesting the previous occupation of an anterior race of men very different from those who now inhabit the same regions. Rude figures, representing the sun, moon, and different animals traced on the hardest rocks of granite."—(Travels, Eng. Trans., vol ii., p. 471-472, cf., also John Whitfield on "Rock Inscriptions in Brazil." Jour., Inst. Anth, 1873.)

In the United States they occur everywhere, and are especially reported from Colorado. Utah, New Mexico, Wyoming, Arizona, and other parts of the Rocky Mountain Region. In Utah, in the Upper streams of the Colorado, where once resided the mythical ancestors of the Moquis Pueblo Indians, (the present inhabitants of these spots who are "incapable of expressing an idea, or representing anything by means of signs or drawings."—Bull. Buffalo Soc. Nat., etc., vol. iii., p. 173), the red sandstone rock which forms the Cañon walls, and also the broad blocks of it on which the houses of these people are said to have stood, are covered with chiselled inscriptions, the significance of which is problematical. The inscriptions moreover are not always on sandstone, sometimes "they are engraved on the smooth exposed

* It will not be without interest, in this connection, to refer to the rock paintings of New Zealand, which have been subjects of communication to the New Zealand Institute, by W. B. D. Mantell, (Trans. N. Z. Inst. 1868, vol. I, n. e., page 6), and Dr. Haast (op. cit 1877, vol. x, page 44.) Although we may feel sceptical towards the inferences which have been drawn on a critical examination of them by Mr. Mackenzie Cameron (op. cit 1879, vol. XI page 154,) who is of opinion that they are eloquent of a prehistoric intercourse between India and New Zaland. Also to the anomalous exhibition, in the Tattoo marks of Motu natives of New Guinea, of characters similar to those of the Azoka Inscriptions of India, which are themselves allied to Phœnician, (Journ. Anthrop. Inst. 1878 Paper by Mr. Park Harrison.)

surface of detached boulders of a hard dark colored rock." They occur also, "pricked out, and not scratched or cut and generally, but not always, are shallow and not easily discernable."—(J. D. Putman in Proc. Davenport Acad. Nat. Sc., 1875, vol. i. p. 14).

I have referred especially to these American illustrations because they present much in common with the subject of my remarks. The figures too are often conventional signs, and it is not a little curious to meet with ones similar in form to these from a Queensland locality.—(Proc. Davenport Acad. Nat. Sc. vol. i. Pl. xxviii., fig. 4., and Pl. xxix. fig. 8).

Rock engravings have also been previously shown to exist in Australia.

G. Krefft, in 1873, sent to England a copy of a few sketches found in the neighbourhood of Sydney, engraved on rocks, and representing fishes, whales, birds, and a few men.—(*Nature*, vol. ix., 1874, p. 322).

Peschel, in 1874, writes of "remarkable etchings an inch in depth on the East Coast," instancing those at "Camp Cove, near Sydney, where rude outlines of men and animals may be discerned."—(Races of Man, 2nd Ed., Eng. Trans. 1876, p. 332).

Brough Smith, in 1878, mentions "sculptured rocks on the South Head of Sydney, near Bondi, where men, sharks, fish, etc., are carved on the flat sandstone rocks."—(Op. Cit. vol.i. p. 292).

Sir Charles Nicholson, in 1879, at a meeting of the Anthropological Institute (March 29th), referring to stone engravings near Sydney,—rude carvings of animal forms, especially kangaroos, and fish—takes occasion to mention their occurrence at various points between Cape Howe and Moreton Bay.

From all these descriptions the inference is unavoidable that the respective authors are dealing with figures which without hesitation they can refer to known objects or classes of objects.

As a further instance I wish to refer you to some figure (Pl. XII) a drawing of which has been in the Queensland Museum without history, since 1876. The originals are engraved on a sandstone rock or rocks, in the bed of the Burnett River, at Bingera. I need scarcely point out the interest which resides in these. They resemble some of the ones I am more immediately concerned with, and although the objects to which they refer may be inferred, they are further evidence that this custom of rock engraving had a sufficiently wide extension.

Australian Rock-drawings, whether painting or engraving, may I think, be classed either as :—

1. Idle scratchings without further significance.

2. Delineations of Natural Objects grouped to form pictographic expressions, intelligible alone to those to whom the facts to which they relate are previously accessible, which will include the ordinary rock engravings or paintings whether on stone or bark.

3. Delineations of conventional symbols universally intelligible amongst the blacks themselves, a class to which I refer the present examples.

Regarding the engravings from an intrinsic point of view, it is not difficult to apprehend that some at any rate may represent animals, especially when a native fashion in pourtraying objects is borne in mind. I allude to that of tracing lines parallel to those first intended to mark the bounding surfaces, a practice which would certainly result in very attenuated objects.

Without further conjecture, however, I wish to point out what may be learnt by instituting a comparison with other figures of conjectural meaning only found amongst the blacks, either on their bodies or on their personal property.

Fig. 1 resembles one of the figures given by Sir John Fraser in his paper on the "Aborigines of New South Wales," (Journ. Roy. Soc. N.S.W., 1882, vol xvi, page 201) as that of the "Mombarai" or drawing, *i.e.*, the characteristic scar on arm or chest, of a native of Queensland.

Fig. 2 is evidently the equivalent of this "Mombarai" which a photograph of a Brisbane black well known as "King Sandy" plainly exhibits on the left arm. (Pl. XII.)

Fig. 3 is the counterpart of another similar mark also found on the arm of a Brisbane black. (Pl. XII.)

Fig. 2 also corresponds with the mark which forms a conspicuous pattern on a shield of a Queensland native as figured by Brough Smith (Op. Cit., vol. 1, page 334).

Fig. 4 finds its equivalent in a mark repeated several times, on a boomerang of a Queensland black in the collection of the Queensland Museum. (Pl. XII.)

I have no doubt also that numerous of the figures on the rock tablet, if not all, could be similarly correlated with and illustrated by marks of this character, derived from such various sources as indicated, which will be best seen by those whose avocations lead them where the aborigines are still plentiful. Reference to the paper above cited, will show the value of these marks on their bodies as distinguishing signs to other natives, marking the tribe or sub-tribe to which the holders of them belong. Mr. Fraser who moreover regards these marks as symbols, further adds

that their own tattoo mark is that with which they distinguish personal property. Now this custom is alluded to by Collins (Op. Cit. 1804, page 377), who writes "in ornamenting their weapons and instruments each tribe used some peculiar form by which it was known to what part of the country they belonged." Brough Smith has also written in the same strain, and figures several marks found on boomerangs from Queensland.

These "Mombarai" or distinguishing tattoo marks, these signs of ownership on their personal property, may, I think, be regarded, with those blacks who made use of them, as conventional symbols for the totems which may be any natural object, especially when one bears in mind the purpose which pictorial representations or symbolical representation of totems are made to serve amongst races other than the Australians, where toteism exists. As for instance, amongst the North American Indians, where as Max Müller expresses it (Chips from a German Workshop, vol. i, p. 318).—"Every warrior has his crest which is called his totem, and it is painted on his tombstone," a subject which is fully entertained in Mallery's "Sign Language amongst North American Indians," (Smithsonian Institute, Bureau of Ethnology) where the very instance which Max Müller introduces as a typical illustration of his remark appears to form the subject of a figure.

This connection between tattoo marks ('totem' signs where "toteism" exists) distinguishing marks for personal property, and stone engravings is a very interesting one, especially for those who endeavour to find, in this practice of tattooing, the origin of the use of graved or written symbols. Peschel in writing of the Berbers of Algeria, remarks: "In the hieroglyphic inscriptions these people bear the name of 'Temhu,' and are recognisable on the Egyptian monuments by tatoo marks in the shape of a cross, which are said to be still customary among the Kabyl (Fr. Berber) women.—("Races of Man," p. 482).

On the ground then that we are dealing with signs which represent totems, I am of opinion that these rock engravings, under consideration, are conventional symbols for the totems of several tribes or sub-tribes. These they therefore serve to enumerate, or they may express numerous objects which these signs for totems are known to embrace. In either alternative they may be ideographic expressions of events,—for the ideas of persons, and so tribes, personal or tribal property, and even districts have been expressed by the symbols denoting the totems of the persons.—(*cf.* Herbert Spencer "Essays, etc.," vol. iii. 2nd Ed. "On the origin of animal worship;" also,

Genesis x. v. 1-32, where as Peschel remarks "a system of Ethnography of the Mediterranean nations is sketched, in which names of countries, nations, or towns, are attributed to fictitious heads of families." (Op. cit. p.494)

"Facts of to day are, in a sense, the most ancient history," and the value of recording engravings such as these will, I think, be allowed when their place is assigned amongst the various stages which written speech has gone through in arriving at its present state of multiform expression (*cf* Herbert Spencer on "Progress" Op. Cit. vol. 1, page 18). They are briefly these which may be grouped under the titles, I Non-Phonetic, II, Sub-Phonetic, and III, Phonetic.

I. Non-Phonetic includes (1) Pictographs or imitative signs, a class with numerous examples in the rock engravings and paintings throughout Australia. The mural paintings of early Egyptian and Assyrian monuments also belong, according to some authorities, to this class. With some races it is long obsolete, others recent.

(2) Ideographs, or expression by conventional signs. This is immediately derived from the first class as a higher stage, or is itself primordial and connate with gesture communication. The present rock engravings belong, I submit, to this class which also includes most of the drawings of the Indians of the New World. Representatives are found in New Zealand, (Mantell and Haast) and amongst the less civilized nations throughout the world, and in the traditions of civilized ones. With the advent of proper names and the necessity for expressing these, and abstract ideas generally, arose the

II. Sub-Phonetic expression with (1) cuneiform writing made up of symbols not necessarily phonetic, and when so not always syllabic, accompanied by a determinative sign, (Layard, Nineveh vol. ii. page 192) which is either a conventional symbol or a difficult ideogram. This is the nature of the Assyrio-Babylonian inscriptions.

(2) Hieroglyphic writing with its phonetic symbols representing simple or syllabic sounds, accompanied by an imitative emblem or pictogram as a determinative sign. Examples of this class are found in Mexico and Egypt.

Contemporaneously with hieroglyphic and cuneiform writing arose the Hieratic or cursive forms of each of them, for events of minor importance; and from these again the demotic or popular writing of Egypt, partially alphabetic and the alphabetical Phœnician. This Phœnician with the Oriental languages generally, whose origin it seems to indicate, and all the modern methods of literary expression represent the Phonetic group.

APPENDIX

Plate XIII.

THE ASH-BED AND ITS CONTENTS.

It is very unusual to find in localities frequented by Australian blacks, for camping grounds or other purpose, any but small heaps of ashes. This one was of very considerable size however, occupying the whole floor of the rock-shelter, and heaped somewhat against the wall on which the figures were delineated. On careful examination these ashes were found to contain fragments of bone, and stone implements. Amongst the former were represented the common Wallaby (*Halmaturus dorsalis*); the 'Possum (*Phalangista vulpina*); the Flying Squirrel (*Petaurus taguanoides*); the Kangaroo Rat (*Hypsiprymnus murinus*); the common Bandicoot (*Perameles nasuta*), and the common Creek Lizard (*Amphibolurus branchialis. De Vis*). There were also pieces of the shell of the large fresh-water Unio, from the Condamine waters; and of Helix Cunninghamii, from the adjacent scrub. No vestiges of human bone were met with, and if any sepulchral rites were performed at this spot they seem to have been of the nature of eating and drinking. To gain the more luscious morsels indeed, all the medullary bones of the animals mentioned had been split across, and in some instances slight cuts had been made on the shafts of the long bones, to determine, as it were, the points of fracture.

The stone implements which were also amongst the ashes, eight of which are figured (Plate XIII.) are made of quartz rock of different degrees of silification from almost pure amorphous quartz to phonolite They are mostly flakes which have been variously chipped, but none of them polished.

No regular cores were met with but most of the specimens exhibit the "bulb of percussion," in attestation of their genuineness. They were evidently intended for cutting instruments (especially Nos. 7, 8, 9), and several have their cutting edges slightly chipped on one face rendering them finely serrated. They may have been fastened into handles by "native pitch," as is customary amongst the tribes of the north-west. Some conform to certain types presented by examples of the European pre-historic stone age (Nos. 3 and 5) viz., elongated so-called spear heads plane on one side and with a mesial longitudinal ridge on the other.

It is evident that all these implements would serve a useful purpose, as knives and scrapers, in connection with the comestibles enumerated, and might have been used in making the numerous chiselled figures, especially the drilled holes, on the rock wall.

ON NEW AUSTRALIAN LIZARDS.

By C. W. De Vis.

Since the date of Dr. Gunther's List of Australian Lizards (Zoology, Erebus and Terror) additions to that record have been made by himself in the Annals of Nat. Hist., and Journal of the Goddefroy Museum, by Professor Cope in the Proceedings of the Philadelphia Academy of Science, but in far greater number by Professor Peters and other German naturalists in periodicals of that country. Much, however, remains to be discovered about the specific forms of our saurians and it is unfortunate for Queensland observers that so much of what is known in detail is nearly inaccessible. The descriptions of the newer species are in works obtained with difficulty. The types of the older ones are in Europe, and the descriptions of them by Dr. Gray are in most cases utterly useless. One day doubtless all these will be re-described, and the scattered notices of the others will be brought together for the behoof of the Australian student, who will, then at least, be no longer beholden to extraneous naturalists for the determination of new forms. The time indeed will come, in or before the next generation let us hope, when the practice of sending collections to be studied in Europe will be considered disgraceful. In this respect the mother colony is setting a good example to her offspring and her sisters, and that it should not be followed by all is even now not altogether satisfactory.

During a recent examination of the lizards in the Queensland Museum there have occurred several species which are evidently undescribed—of these three are now submitted to the notice of the Society.

Silubosaurus Zellingi.—Habit short, broad, depressed, especially on the tail which is less than half as long as the body. The head forms an isosceles triangle with its apex truncated, its sides flat, cuneiform. Head shields thick, rugose. The narial portion of the nasal is entirely separated from the posterior part by the nasal groove. Ear orifice fringed anteriorly with three bifid free scales. Labials $\frac{8}{8}$. Interparietal large, larger than fronto-parietals, not enclosed behind. Scales of the trunk in 38 rows—those of the lower surface smooth, sub-equal; the preanals larger. The central subcaudals but little larger than the laterals.

Scales on the back large and increasing in size on the tail, the post-occipitals with several obtuse denticles. The spines of the scales as the latter recede from the occiput become gradually fewer till on the tail they form 8 rows of single spines, the two lateral rows on each side being much the longest. Limbs strong, sub-equal in length, sequence of toes $\frac{1}{1}\frac{5}{5}\frac{2}{2}\frac{3}{3}\frac{4}{4}$

Colour, reddish grey above with darker lines along the rows of spines, and irregular light patches arranged sub-linearly, the three medial rows being pretty regular. The ground colour descends on the sides in irregular streaks. Beneath grey.

Total length	83 lines	Length between the limbs	30 lines
Length of tail	21 lines	Length of fore limb	17 lines
Length of head	13 lines	Length of fourth toe	5 lines
Breadth of head at ears	10 lines	Length of hind limb	20 lines
" " eyes	6½ lines	Length of fourth toe	5½ lines

Localty, Barcoo. This specimen was kindly contributed by Mr. C. W. De Burgh Birch, Count Zelling. As this gentleman has on previous occasions shown his desire to promote zoology, he is entitled to the compliment of having his name associated with the species. The lizard agrees with *S. depressus, Gunther*, in being much depressed posteriorly, and with *S. Stokesii, Gr*, in the caudal scales being unispinous. In colouring it differs from both.

ŒDURA TRYONI.—A large supranasal in contact by suture with its fellow of the opposite side, or occasionally separated by an intercalated frontal scale. The longitudinal and transverse sutures between the rostral and supranasals form a cross upon the muzzle. Labials $\frac{11}{12}$ the ninth under the pupil, the three symphysial shields are the largest below. No infralabials. Scales large, especially on the back and postanal convexity, those of the under side of the head a little smaller than those of the chest. Tail rounded, conical, rapidly tapering. Head shorter than in *O. marmorata*. The postanal swelling large with one large flat scale on each side, sub-digital cushions of digits 1 to 3, single at the base and in 3 pairs medial smaller than the terminals; of toes, 2, 3, and 4, with two single at the base, and four pairs medial, pollex with a single one in lieu of the distal pair.

Colour above grey to dark-brown, the markings variable, generally pale on a dark ground, occasionally the reverse, consisting of ocellated spots more or less confluent and irregularly scattered, or of obscurely defined pale-centred angular spots very confluent, or round pale spots enclosed in dark cross bands over the back and on the head, in lines converging to the nape, or of pale irregular flecks on a dark ground with streaks from the ear

converging to the neck. Tail with angular spots and streaks of black. The young dark brown, with white bars on the nape, 10—12 bars composed of more or less distinct double spots on the back and tail and the sides a little spotted.

Total length	26—21 lines	Length between the limbs	13—17 lines
Length of tail	21—18 lines	Length of fore limb	8— 6 lines
Length of head	7—5½ lines	Length of hind limb	10—9½ lines
Length of snout	3½—2½ lines		
Length of interorbit	2½—2 lines		

Locality, Stanthorpe. Collected by the Hon. Sec., Mr. H. Tryon, to whom it is dedicated.

The characteristics of the species are its contiguous supranasals, the conspicuous ocellations of its back and flanks, and its large scales. It is by far the handsomest of its kind.

Physignathus lesueurii

AMPHIBOLURUS BRANCHIALIS.—Habit, elongate with powerful limbs. Head large, deep, triangular, with large parotids. Nuchal crest high, composed of 10—15 compressed scales passing suddenly but without interval into the dorsal, which is also high and continued to the middle of the tail, the rest of the tail bicarinate as in Hydrosaurus. Scales of the head angularly tubercular, of the supraorbital smaller. The superorbital region is limited axiad by a curved row of ridge-like scales. A few large conical scales on the upper edge of the parotid—3—4 very large ones on its posterior angle, and below it a long row of conical scales in a line with the lower edge of the mandible. Labials large, with a row of similar scales along the lower edge of the mandible. Scales of the neck and shoulders granular, of the flanks and tail rhombic, sharply keeled; 7—8 oblique rows of large conical scales on the sides, similar rows on the thighs and shanks. Scales of the chin elongately tubercular, of the throat rhombic; of the lower part of the abdomen rhombic, flat, almost smooth. Femoral pores 8—9 in a closely beset line with occasionally an additional group behind it. Preanal pores 2—3.

Colour, grey to dark brown, with 6—7 more or less persistent black cross bands. A broad black streak from the eye through the ear to the hinder edge of the parotid, and a large black patch on the shoulder. Dorsal crest black with occasional white scales. In the young the cross bands of larger scales are frequently white.

Total length	294 lines	Length between the limbs	33 lines.
Length of tail	201 lines	Length of fore limb	39 lines.
Length of head	21 lines	Length of fourth toe	11 lines.
Breadth of head at ears	15 lines	Length of hind limb	71 lines.
Breadth of head at eyes	10 lines	Length of fourth toe	17 lines.

Locality, neighbourhood of Brisbane, common in most of the creeks. Its habits are essentially aquatic; it may with caution be often observed sitting on the snags beside the water, into which it drops at the slightest alarm. Occasionally it rises to protrude its nose above the surface, but like its relative *Grammatophora muricata*, and perhaps others of the sept, it can remain at the bottom for a long period. Received also from the Tweed River.

ON A NEW FORM OF THE GENUS THERAPON.

BY C. W. DE VIS.

OUR fresh-water fish are as yet but very imperfectly known and we are therefore always glad to welcome a new acquaintance in this division of our fauna. Dwellers on our creeks and lagoons would, without much trouble, earn our thanks by sending for examination even dry specimens of all the fish to be caught in them, and would doubtless find that they could frequently enjoy the credit of enlarging the field of knowledge in this direction. This has been exemplified by Mr. Ling Roth, of Mackay, who has been at the pains of conveying from Lake Elphinstone the fish which awaits description. Lake Elphinstone is a sheet of water about six miles long and two miles broad, situate between Nebo and the Suttor River. It lies in a land locked basin, and is without an affluent, but, notwithstanding that it apparently receives only the water shed from the very limited slopes around it, its contents are not diminished by prolonged drought to any very great extent, and they are at all times particularly turbid. We might almost suspect the presence of mud springs at the bottom—apart from turbidity there may also be something in the water still more inimical to animal, or at least to fish life, for Mr. Ling Roth states that the fish under notice is the only one to be found in it. If so, the monopoly it has of the lake may perhaps be explained by the great adaptability to circumstances shewn by the whole genus to which it belongs. This group of Australian perches contains a goodly number of species of which some are littoral sea-fish, others inhabit brackish waters, and others prefer pools and lakes. Their occupation of a habitat unsuitable to other fishes may result from this elasticity of constitution. The Therapons form a very natural group, a pretty strict uniformity of

structure obtaining throughout—their specific characters consist chiefly of ornamental markings, appearing in one series as longitudinal stripes, in another as cross-bands, while in a few species, they are almost obsolete, and to these latter belong the perch of Lake Elphinstone.

THERAPON ELPHINSTONENSIS.—

D 12/10 A 3/8 Lat. line 52 - 54 - Tr. 7/15.

Height of the body equals length of head, and less than one fourth of the whole length; orbit three-fourths of the interorbit, and one-fifth of the length of the head; interorbit one-fourth and snout one-third of the length of the head; outer row of teeth strong and regular; preorbital strongly serrated except one side of one specimen; preoperculum feebly serrated; operculum with one point; coracoid strongly denticulated; maxillary not quite reaching the vertical from the front margin of the orbit; spinous dorsal low, 5th spine the longest, nearly one-third of the depth of the body: second anal spine much stronger, but not longer than the third; caudal slightly emarginate.

Colour, uniform pale-brown, a little redder on the back. The nearest ally of this species is *T. longulus*, *Macl*, from the inland waters of North Australia. Its distinctive characters are much smaller eyes nearer together; smaller scales; a single opercular spine, and a feebly serrated preoperculum of which the serrations are stronger at the lower angle.

NOTES.

On an Anomalous Snake.—One of the characters of the genus Pseudonaja is the possession of two nasal plates between which is the nasal orifice. The only representative we have of the genus, *P. nuchalis*, is in the young state conspicuously marked with broad dark bands across the body, which disappear as the snake approaches maturity, with the exception of one across the nape which is persistent, and gives name to the species. A curious variation has occurred in a very young specimen, 11 inches long, presented to the Queensland Museum by Mrs. Lenneberg of Brisbane. The body is, with the exception of dark edges to the scales above, of uniform pale-brown, but the nuchal band is present and separated by a pale interspace from the suffused brown of the top of the head, in which darker spots are seen on the occipitals and supra-orbitals. The snake exhibits the further anomaly of having but one nasal shield with the nostril in its middle. In all other respects it is a *P. nuchalis*.—C. W. De Vis.

A Possible Source of Isinglass.—The sample of isinglass exhibited is separated mechanically from the fibro-cartilaginous base of the dorsal fin of the shovel-nose shark, *Rhinobatus granulatus*. From an estimate of the cartilage contained in the body of one recently prepared in the museum it would appear that more than one-third of the gross weight of the fish could be converted into commercial gelatine of ordinary and superior quality. The fish is abundant in the bays of the coast, and it would surely be worth trial whether a raw material such as shark's fins largely exported to China could not be profitably utilised at home.

C. W. De Vis.

Nest of Philemon Corniculatus, Lath.—Two nests of the common Leather-head shewn, exemplify the adaptability of so called instinct to the employment of new means to an end. Two separate pairs of birds have discovered a quantity of string and have perceived the advantage of using it in attaching the brim of their nests to the boughs. They have not only laced the nest itself to the bough, and carried the string several times round the bottom of the nest, but they have with evident premeditation hitched loops of the string round neighbouring sprigs six inches from the nest. The lashing of the edge of the nest to the bough and the mooring lines are of strong string, the twine worked in the fabric outside is much finer.—C. W. De Vis.

Mesoplodon Layardi.—The remains of this whale, a member of the *Ziphiidæ*, were found at Zilzie, near Emu Park. They were obtained some distance up the beach, so that probably it had stranded either during a spring tide or a storm. That they

had lain some time was evident from their bleached appearance, and freedom from soft tissues, excepting traces of ligaments on the occipital condyles, and the centra of the 4th and 5th cervical vertebræ.

I believe it is the first instance on record of this rare whale being found on the Queensland coast. Its discovery may be accepted as a proof of its existence in our waters But after making many enquiries amongst seafaring men, I found none who had seen a living specimen. Believing this to be the experience of others, and also remembering the paucity of cetacean remains in our museums, I think Mr. De Vis deserves great praise for his skill in determining the animal from a few of its bones.

I was at first inclined to regard them as belonging to an undescribed species of the genus Ziphius; but the three anchylosed cervical vertebræ, the dental formula, and the peculiar sharp enamelled crown arising from compreseed and ovoid disc of osteodentine, refer it to the genus and species mentioned above.

When the jaws of our subject were surrounded by the usual tissues, the teeth did not project beyond the gums. Now, as *Mesoplodon layardi* is asserted to have its two teeth greatly developed, and even curved round over the rostrum so as to interfere with the movements of the jaws, I infer that, although the Emu Park specimen was adult, it had not advanced very far in years.—W. N. JAGGARD.

A LOCUST PLAGUE ON THE LOWER HERBERT.—Mr. Edward Gedley of Victoria Sugar Plantation, in a letter dated 1st March, 1884, writes "We are troubled with locusts so much so that I fear we shall have to cease work." The subject has also been commented upon in the press throughout the colony. Some of these locusts, stated to be from one to five weeks old, forwarded by Mr. Gedley to the Queensland Museum, prove to be mostly females, not carrying eggs. They are probably the *Stenobothrus vittifrons, Walk.* (*B. M. Cat. Derm. Salt.*, *pg.* 766) previously recorded from Australia, an insect belonging to a well known family of locusts with destructive migratory habits. As it would appear that some at least of the insects originated where their ravages were most felt, one of the difficulties in the way of suggesting a plan for withstanding their incursions is particularly met—a difficulty which was so recently experienced in the case of *Caloptenus spretus Uhler*, of the Western States of America. This destructive locust Caloptenus is also met with in Australia, and to some of its numerous endemic species must I think be referred the depredations of this class so frequently experienced

in Adelaide, where as one of our members, Mr. F. M. Bailey informs me they are kept greatly under control by strewing branches of Castor Oil plant, which acts as a poison on them, in their path. Might not a method for protecting our sugar plantations be suggested by this practice, seeing that the Castor Oil plant grows as rampant as a weed throughout the colony.*

In a subsequent letter dated 10th April, Mr. Gedley writes—"Up to the present time I have been unable to discover any locusts' eggs, although I have a great many observers employed. These pests have now almost entirely disappeared from our neighbourhood, although there remains still a few in the most advanced stage."

"I have been able to trace their line of flight in the first instance. Three years ago they were seen on the top of Sea View Range, nearly due east of Cardwell; they then followed a south-eastern course which brought them to the Valley of the Herbert, on the south side of the river. Having crossed the Stone River they spread themselves all over the vast plain lying between that river, the sea, and the Herbert River, over a surface of some 150 square miles; here, since their first appearance, they seem to have bred and flourished. The way they disappear is not so plain, it is quite likely that they only go into the ground to lay their eggs; their flight is most erratic, sometimes they seem to be going north with a strong flight, they then suddenly whirl round and return to the south."

"They have done us a great deal of harm this year, probably £30,000 would not cover it."

"In the very earliest stage they are like a lot of large fleas, very active and alive to danger. As they grow they become less active, and so on until they become possessed of wings; immediately after they have become winged they are exceedingly delicate and easily killed; in a few minutes, however, the wings darken in color, and the insect flies off. I have seen large areas covered with them in this stage. I have noticed also that they eat each other. Having confined 18 in a bottle they were reduced to 7 the following morning; one or two died in captivity—those that remained alive ate the bodies, &c."

"My plan for their extermination is to drive them into trenches and bury them; I have also surrounded them with fire. All kinds of insect-eating birds feast on them, even the common black Crow gets his share. Spoonbills, Ibis, and other birds are here in large congregation."—H. Tryon.

* Mr. Bailey also suggested the use of the "lark's-spur" plant, which was found to act as an almost instantaneous poison, whilst the Castor Oil plant was found to be much slower in its effects.

TUESDAY, 13TH MAY, 1884.

THE PRESIDENT HON. A. C. GREGORY, C.M.G., IN THE CHAIR.

The following Donations were announced:—

1. "Report of Progress" for 1880-81-82. Geological and Natural History Survey of Canada. Montreal, 1883. From Alfred R. C. Selwyn, L.L.D., F.R.S., Director, Geological and Natural History Survey of Canada.
2. "Maps to accompany Report of Progress for 1880-81-82. Montreal, 1883. 1d.
3. "Catalogue of Canadian Plants." Part I. Polypetalæ, by John Macoun, M.A., F.L.S., Montreal, 1883. 1d.
4. "Journals of Australian Explorations," by A. C. Gregory, C.M.G., F.R.G.S., &c, and F. T. Gregory, F.R.G.S., etc., Brisbane, 1884. From Hon. A. C. Gregory, C.M.G., &c.
5. "Eucalyptographia," by Baron Ferd. Von Mueller, K.C.M.G., M. and Ph. D., F.R.S., etc. From the Author.
6. "Systematic Census of Australian Plants. First Annual Supplement," by Baron Ferd. Von Mueller, K.C.M.G., etc., Melbourne, 1884. From the author.

The following Papers were read:—

A CONTRIBUTION TOWARDS A FLORA OF MOUNT PERRY

BY

F. M. BAILEY, F.L.S., GOVERNMENT BOTANIST.

Mr. James Keys, of Mt. Perry, has from time to time sent me down the plants of his neighbourhood for determination; and it is by reason of his efforts, in this direction, that the present attempt at a local Flora has been rendered possible.

ORDER RANUNCULACEÆ.

Clematis glycinoides, *DC.* (Virgin's Bower, or Traveller's Joy.)

ORDER DILLENIACEÆ.

Hibbertia linearis, var. obtusifolia,

ORDER ANONACEÆ.

Melodorum Leichhardtii, *Benth.*

ORDER MENISPERMACEÆ.

Stephania hernandiæfolia, *Walp.*

ORDER CRUCIFERÆ.

Cardamine hirsuta, *Linn.*

ORDER CAPPARIDEÆ.

Capparis sarmentosa, *A. Cunn.*
,, nobilis, *F.v.M.*
,, canescens, *Banks.*

ORDER VIOLARIEÆ.

Viola betonicæfolia, *Sm.* (Violet.)
,, hederacea, *Labill.* (Creeping Violet.)
Ionidium suffruticosum, *Ging.*

ORDER PITTOSPOREÆ.

Pittosporum rhombifolium, *A. Cunn.*
,, revolutum, *Ait.*
Citriobatus multiflorus, *A. Cunn.*

ORDER POLYGALEÆ.

Polygala japonica, *Houtt.* (Milk wort.)

ORDER PORTULACEÆ.

Portulaca oleracea, *Linn.* (Pigweed.)

ORDER HYPERICINEÆ.

Hypericum gramineum, *Forst.* (St. John's wort.)

ORDER MALVACEÆ.

Malvastrum spicatum, *A. Gray.*
,, tricuspidatum, *A. Gray.*
Sida corrugata, *Linn.*
,, subspicata, *F.v.M.*
,, rhombifolia, *Linn.* (Sida-weed.)
Abutilon oxycarpum, *F.v.M.*
,, auritum, *G. Don.*
Hibiscus rhodopetalus, *F.v.M.*
,, splendens, *Fraser.*

ORDER STERCULIACEÆ.

Sterculia quadrifida, *R. Br.*
,, Bidwilli, *Hook.*

Sterculia diversifolia, *G. Don.* (Currijong.)
,, rupestris, *Benth.* (Narrow-leaved Bottle-tree.)
Melhania incana, *Heyne.*
Waltheria americana, *Linn.*
Commersonia echinata, *Forst.*

ORDER TILIACEÆ.

Grewia latifolia, *F.v.M.*
Elæocarpus obovatus, *G. Don.*

ORDER LINEÆ.

Erythroxylon australe, *F.v.M.*

ORDER ZYGOPHYLLEÆ.

Tribulus terrestris, *Linn.*

ORDER GERANIACEÆ.

Geranium dissectum, *Linn.*
Erodium cygnorum, *Nees.*
Oxalis corniculata, *Linn.* (Small horned Wood-Sorrel.)

ORDER RUTACEÆ.

Zanthoxylum brachyacanthum, *F.v.M.*
Geijera Muelleri, *Benth.*
,, salicifolia, *Schott.*
Acronychia Baueri, *Schott.*
,, lævis, *Forst.*
Micromelum pubescens, *Bl.*
Clausena brevistyla, *Oliver.*

A very rare shrub, not before met with so far south, said to bear an intense red fruit, which might probably be utilised as that of its near ally Atalantia, for preserves.

ORDER SIMARUBEÆ.

Ailanthus imberbiflora, *F.v.M.*

ORDER BURSERACEÆ.

Canarium australasicum, *F.v.M.*

ORDER MELIACEÆ.

Turræa pubescens, *Hellen.*
Melia composita, *Willd.* (White Cedar.)
Dysoxylon Muelleri, *Benth.*
Synoum glandulosum, *A. Juss.*
Owenia venosa, *F.v.M.*
Cedrela Toona, *Roxb.* (Red Cedar.)
Flindersia Australis, *R. Br.* (Yellow-wood.)

ORDER CELASTRINEÆ.

Elæodendron australe, *Vent.*
„ melanocarpum, *F.v.M.*
Siphonodon australe, *Benth.*

ORDER STACKHOUSIEÆ.

Stackhousia monogyna, *Labill.*

ORDER RHAMNEÆ.

Alphitonia excelsa, *Reissek.* (Red Ash.)

ORDER AMPELIDEÆ.

Vitis antarctica, *Benth.*
„ oblonga, *Benth.*
„ nitens, *F.v.M.*
„ acris, *F.v.M.*
„ clematidea, *F.v.M.*
„ hypoglauca, *F.v.M.*
„ opaca, *F.v.M.*

ORDER SAPINDACEÆ.

Cupania anacardioides, *A. Rich.*
„ pseudorhus, *A. Rich.*
„ xylocarpa, *A. Cunn.*
„ nervosa, *F.v.M.*
Ratonia pyriformis, *Benth.*
Nephelium tomentosum, *F.v.M.*
Harpullia pendula, *Planch.* (Tulip-wood.)
Dodonæa triquetra, *Andr.* (Hop-bush.)
„ viscosa, *Linn.*
„ cuneata, *Rudge.*

ORDER LEGUMINOSÆ SUBOR. PAPILIONACEÆ.

Jacksonia scoparia, *R. Br.* (Dogwood.)
Crotalaria alata, *Hamilt.* (Rattle pod.)
„ linifolia, *Linn. f.*
„ Mitchelli, *Benth.*
„ trifoliastrum, *Willd.*
„ incana, *Linn.*
Lotus, australis, *Andr.*

This Australian Bird's-foot Trefoil is looked upon in some parts as a poison herb.

Indigofera enneaphylla, *Linn.*
„ hirsuta, *Linn.*
„ pratensis, *F.v.M.*

Indigofera Baileyi, *F.v.M.*
„ australis, *Willd.*
Tephrosia filipes, *Benth.*
„ purpurea, *Pers.*

In some parts of Australia this has been found poisonous to stock.

Swainsona galegifolia, *R. Br.* (Indigo or Darling Pea.)
„ brachycarpa, *Benth.*
Æschynomene falcata, *DC.*
Zornia diphylla, *Pers.*
Desmodium gangeticum, *DC.*
„ brachypodum, *A. Gray.*
„ varians, *Endl.*
„ parvifolium, *DC.*
Uraria picta, *Desv.*
Lespedeza cuneata, *G. Don.*
Glycine clandestina, *Wendl.*
„ tabacina, *Benth.*
Hardenbergia monophylla, *Benth.* (Bushmen's Sarsaparilla.)
Erythrina vespertilio, *Benth.* (Coral or Cork-tree.)
Canavalia obtusifolia, *DC.*
Vigna vexillata, *Benth.*
Atylosia reticulata, *Benth.*
Rhynchosia Cunninghamii, *Benth.*
„ minima, *DC.*
Lonchocarpus Blackii, *Benth.*
Castanospermum australe, *A. Cunn.* (Moreton Bay Chestnut.)

Suborder Cæsalpinieæ.

Cæsalpinia sepiaria, *Roxb.* (A strong hedge plant, naturalised.)
Cassia Sophera var. schinifolia
„ concinna, *Benth.*
„ mimosoides, *Linn.*

Suborder Mimoseæ.

Neptunia gracilis, *Benth.* (Native Sensitive Plant.)
Acacia penninervis, *Sieb.*
„ decora, *Reichb.*
„ podalyriæfolia, *A. Cunn.*
„ implexa, *Benth.*
„ aulacocarpa, *A. Cunn.*
„ Bidwilli, *Benth.*
Pithecolobium pruinosum, *Benth.*

ORDER ROSACEÆ.

Rubus moluccanus, *Linn.*
,, parvifolius, *Linn.*
,, rosæfolius, *Sm.* (Raspberry.)

ORDER SAXIFRAGEÆ.

Argophyllum Lejourdanii, *F.v.M.*
Abrophyllum ornans, *Hook, F.*

ORDER CRASSULACEÆ

Tillæa verticillaris, *DC.*

ORDER DROSERACEÆ.

Drosera Burmanni, *Vahl.* (Sundew.)
,, auriculata, *Backh.* (Sundew.)

ORDER HALORAGEÆ.

Haloragis heterophylla, *Brongn.*
Myriophyllum verrucosum, *Labill.*
,, variæfolium, *Hook.*

ORDER MYRTACEÆ.

Callistemon lanceolatus, *DC.* (Bottle-brush.)
Melaleuca linariifolia, *Sm.*
Angophora subvelutina, *F.v.M.* (Apple tree.)
Eucalyptus acmenioides, *Schau.* (Stringy-bark.
,, melanophloia, *F.v.M.* (Silver-leaved Ironbark.)
,, crebra, *F.v.M.* (Ironbark.)
,, tereticornis, *Sm.* (Blue Gum)
,, tesselaris, *F.v.M.* (Moreton Bay Ash.)
,, corymbosa, *Sm.* (Bloodwood)
,, maculata, *Hook:* (Spotted Gum.)
,, var. citriodora. (Citron scented Gum.)
Tristania suaveolens, *Sm.*
,, conferta, *R. Br.* (Brisbane Box.)
Myrtus Hillii, *Benth.* (Scrub Iron-wood.)
,, racemulosa, *Benth.*
Eugenia Smithii, *Poir.* (Lilly Pilly.)
,, Ventenatii, *Benth.*
,, myrtifolia, *Sims.* (Scrub Cherry.)

ORDER MELASTOMACEÆ.

Melastoma malabathricum, *Linn.*

ORDER LYTHRARIEÆ.

Ammannia pentandra, *Roxb.*

ORDER ONAGRARIEÆ.

Jussiæa suffruticosa, *Linn.*

ORDER CUCURBITACEÆ.

Melothria Cunninghamii, *F.v.M.*
Mukia scabrella, *Arn.*

ORDER CACTEÆ.

Opuntia vulgaris, *Mill.* (Prickly Pear, naturalized.)

ORDER UMBELLIFERÆ.

Hydrocotyle hirta, *R. Br.*
,, asiatica, *Linn.*

In the Mauritius, where this plant is called " Bevilaqua," it is highly extolled as a remedy in diseases of the skin.

Trachymene procumbens, *Benth.*
Eryngium expansum, *F.v.M.*
Apium leptophyllum, *F.v.M.*

ORDER ARALIACEÆ.

Panax elegans, *F.v.M.*

ORDER CORNACEÆ.

Marlea vitiensis, var. tomentosa.

ORDER CAPRIFOLIACEÆ.

Sambucus Gaudichaudiana, *DC.*

ORDER RUBIACEÆ.

Dentella repens, *Forst.*
Knoxia corymbosa, *Willd.*
Hodgkinsonia ovatiflora, *F.v.M.*
Plectronia odorata, *F.v.M.*
Ixora Becklerii, *Benth.*
Pavetta indica, *Linn.*
Psychotria loniceroides, *Sieb.*
,, daphnoides, *A. Cunn.*
Pomax unbellata, *Sol.*
Spermacoce multicaulis, *Benth.*

ORDER COMPOSITÆ.

Centratherum muticum, *Less.*
Ageratum conyzoides, *Linn.*
Lagenophora Billardieri, *Cass.*
Calotis dentex, *R. Br.*
,, lappulacea, *Benth.*

Olearia Nernstii, *F.v.M.*
Erigeron linifolius, *Linn.* (Cobbler's-pegs.)
Vittadinia brachycomoides, *F.v.M.*
„ australis, *A. Rich.*
„ scabra, *DC.*
Blumea hieracifolia, *DC.*
Pterocaulon sphacelatum, *Benth et Hook.*
Helipterum polyphyllum, *F.v.M.*
Helichrysum bracteatum, *Willd.*
„ apiculatum, *DC.*
Cassinia lævis, *R. Br.*
Podolepis acuminata, *R. Br.*
Xanthium spinosum, *Linn.* (Bathurst Burr.)
Siegesbeckia orientalis, *Linn.*
Eclipta platyglossa, *F.v.M.*
Spilanthes grandiflora, *Turez.*
Tagetes glandulifera, *Schrank.* (Stinking Rodger.)
Erechthites Ackinsoniæ, *F.v.M.*
Senecio amygdalifolius, *F.v.M.*
Picris hieracioides, *Linn.*

ORDER STYLIDIEÆ.

Stylidium graminifolium, *Sw.*

ORDER GOODENOVIEÆ.

Goodenia heterophylla, *Sm.*
„ glabra, *R. Br.*
„ grandiflora, *Sims.*
Velleia spathulata, *R. Br.*

ORDER CAMPANULACEÆ.

Lobelia gibbosa, *Labill.*
„ purpurascens, *R. Br.*
Wahlenbergia gracilis, *A. DC.* (Blue-bell.)

ORDER EPACRIDEÆ.

Acrotriche aggregata, *R. Br.*

ORDER PLUMBAGINEÆ.

Plumbago zeylanica, *Linn.* (Leadwort.)

ORDER PRIMULACEÆ.

Anagallis arvensis, *Linn.* (Pimpernel, naturalized.)

ORDER MYRSINEÆ.

Myrsine variabilis, *R. Br.*
Samara australiana, *F.v.M.*

ORDER SAPOTACEÆ.

Lucuma (Sersalisia) sericea, *R. Br.*
Sideroxylon (Achras) myrsinoides, *A. Cunn.*

ORDER EBENACEÆ.

Maba geminata, *R. Br.*
„ humilis, *R. Br.*

ORDER OLEACEÆ.

Jasminum racemosum, *F.v.M.*
„ lineare, *R. Br.*
„ simplicifolium, *Forst.*
Notelæa microcarpa, *R. Br.*
Olea paniculata, *R. Br.* (Australian Olive.)

ORDER APOCYNACEÆ.

Chilocarpus australis, *F.v.M.*
Carissa ovata, *R. Br.*
Alyxia ruscifolia, *R. Br.*
Tabernæmontana orientalis, var. angustifolia.
Lyonsia lilacina, *F.v.M.*
„ reticulata, *F.v.M.*
„ latifolia, *Benth.*
„ eucalyptifolia, *F.v.M.*
„ straminea, *R. Br.*
Parsonsia, ventricosa, *F.v.M.*

ORDER ASCLEPIADEÆ.

Secamone elliptica, *R. Br.*
Asclepias curassavica, *Linn.*
(Red-head or Wild Ipecacuanha, naturalized.)
Sarcostemma australe, *R. Br.* (Gaoloowurrah.)
Gongronema micradenia, *Benth.*
Tylophora grandiflora, *R. Br.*
Marsdenia rostrata, *R. Br.*
Hoya australis, *R. Br.* (Honey Flower.)

ORDER LOGANIACEÆ.

Mitrasacme indica, *Wight.*
„ pygmæa, *R. Br.*

ORDER GENTIANEÆ.

Erythræa australis, *R. Br.* (Centaury.)
Limnanthemum crenatum, *F.v.M.* (Yellow fringed Water Lily.)

ORDER BORAGINEÆ.

Trichodesma zeylanicum, *R. Br.*

ORDER CONVOLVULACEÆ.

Ipomæa hederacea, *Jacq.*
„ plebeia, *R. Br.*
Evolvulus alsinoides, *Linn.*

ORDER SOLANACEÆ.

Lycopersicum esculentum, *Mill.* (Tomato naturalized.)
Solanum nigrum, *Linn.* (Common black Nightshade.)
„ aviculare, *Forst.*
„ verbascifolium, *Ait.*
„ discolor, *R. Br.*
„ stelligerum, *San.*
„ ellipticum, *R. Br.*
Datura fastuosa, *Mill.* (Proud Thorn-apple, naturalized.)
Nicotiana suaveolens, *Lehm.* (Sweet Tobacco.)

ORDER SCROPHULARINEÆ.

Morgania glabra, *R. Br.*
Gratiola pedunculata, *R. Br.*
Artanema fimbriatum, *Don.*
Veronica calycina, *R. Br.*
Buchnera ramosissima, *R. Br.*
Centranthera hispida, *R. Br.*

ORDER LENTIBULARIEÆ.

Utricularia dichotoma, *Labill.* (Bladder-wort.)

ORDER BIGNONIACEÆ.

Tecoma australis, *R. Br.*

ORDER ACANTHACEÆ.

Hygrophila salicifolia, *Nees.*
Ruellia bracteata, *R. Br.*
Eranthemum variabile, *R. Br.*
„ tenellum, *Benth.*
Justicia procumbens, *Linn.*

ORDER MYOPORINEÆ.

Myoporum debile, *R. Br.*

ORDER VERBENACEÆ.

Pityrodia salvifolia, *R. Br.*
Spartothamnus junceus, *A. Cunn.*
Verbena officinalis, *Linn.*
Callicarpa pedunculata, *R. Br.*
Premna Dallachyana, *Benth.*

Vitex lignum-vitæ, *A. Cunn.*

The fruit of this tree is largely devoured by the fruit-eating pigeon (Megaloprepia magnifica).

Clerodendron tomentosum, *R. Br.*
,, floribunda, *R. Br.* (Supposed poisonous to stock.)

ORDER LABIATÆ.

Plectranthus parviflorus, *Willd.*
Mentha satureioides, *R. Br.* (Pennyroyal.)
Salvia plebeia, *R. Br.*
Anisomeles salvifolia, *R. Br.*
Stachys arvensis, *Linn.* (Hedge-nettle, naturalized.)
Teucrium argutum, *R. Br.*
Ajuga australis, *R. Br.* (Bugle.)

ORDER PLANTAGINEÆ.

Plantago debilis, *R. Br.* (Plantain.)

ORDER NYCTAGINEÆ.

Boerhaavia diffusa, *Linn.*

ORDER AMARANTACEÆ.

Deeringia celosioides, *R. Br.*
,, altissima, *F.v.M.*
Amarantus viridis, *Linn.*
Achyranthes aspera, *Linn.*
Nyssanthes diffusa, *R. Br.*
Alternanthera nana, *R. Br.*

ORDER CHENOPODIACEÆ.

Chenopodium ambrosioides, *Linn.*
,, carinatum, *R. Br.*

ORDER POLYGONACEÆ.

Polygonum minus, *Huds.*
Rumex Brownii, *Camp.* (Dock.)

ORDER ARISTOLOCHIACEÆ.

Aristolochia pubera, *R. Br.* (Birthwort.)

ORDER PIPERACEÆ.

Piper novæ-hollandiæ, *Miq.*

This Pepper bears a large quantity of fruit scarcely inferior to the black pepper of commerce.

Peperomia leptostachya, *Hook et Arn.*

ORDER MONIMIACEÆ.

Kibara macrophylla, *Benth.*

ORDER LAURINEÆ.

Cassytha filiformis, *Linn.* (Laurel Dodder.)

ORDER PROTEACEÆ.

Banksia integrifolia, *Linn, f.* (Honeysuckle tree.)

ORDER LORANTHACEÆ.

Loranthus longiflorus, *Desv.*
,, exocarpi, *Behr.*
,, pendulus, *Sieb.*
Viscum articulatum, *Burm.* (Mistletoe.)

ORDER SANTALACEÆ.

Exocarpus latifolia, *R. Br.*
,, cupressiformis, *Labill.*

ORDER EUPHORBIACEÆ.

Euphorbia Drummondii, *Boiss.* (Sheep poison-herb.)
,, Macgillivrayi, *Boiss.*
,, pilulifera, *Linn.* (Asthma herb.)
Cleistanthus Cunninghamii, *Muell. Arg.*
Phyllanthus Ferdinandi, *Muell. Arg.*
,, lobocarpus, *Benth.*
,, thesioides, *Benth.*
,, albiflorus, *F.v.M.*
,, Gasstrœmii, *Muell. Arg.*
,, minutiflorus, *F.v.M.*
Breynia oblongifolia, *Muell. Arg.*
Petalostigma quadriloculare, *F.v.M.* (Emu apple or bitter-bark.)
Croton insularis, *Baill.*
,, acronychioides, *F.v.M.*
Baloghia lucida, *Endl.* (Scrub Bloodwood.)
Adriana acerifolia, *Hook.*
Acalypha capillipes, *F.v.M.*
Alchornea ilicifolia, *Muell. Arg.* (Queensland Holly-bush.)
Mallotus philippinensis, *Muell. Arg.* ("Kamala" Tree.)
Ricinus communis, *Linn.* (Castor Oil Plant, naturalized.)
Tragia Novæ Hollandiæ, *Muell. Arg.* (Climbing Nettle.)
Homalanthus stillingiæfolius, *F.v.M.*
Excæcaria Dallachyana, *Baill.*

ORDER URTICACEÆ.

Trema aspera, *Blume.*
(Called sometimes Peach-leaved Poison Bush.)
Aphananthe philippinensis, *Planch.*
Malaisia tortuosa, *Blanco.*
Ficus Cunninghamii, *Miq.*
„ macrophylla, *Desf.* (Moreton Bay Fig.)
„ aspera, *Forst.* (Black Fig.)
„ opposita, *Miq.*
„ glomerata, *Willd.* (Cluster Fig.)
Cudrania javanensis, *Trécul.*
Laportea photiniphylla, *Wedd.* (Shiny-leaved Stinging Tree.)
Pipturus argenteus, *Wedd.*

ORDER CASUARINEÆ.

Casuarina glauca, *Sieb.* (River She-oak.)
„ torulosa, *Ait.* (Corky-barked She-oak.)

ORDER CONIFERÆ.

Araucaria Cunninghamii, *Ait.* (Moreton Bay or Hoop Pine.)

ORDER HYDROCHARIDEÆ.

Ottelia ovalifolia, *L. C. Rich.*

ORDER ORCHIDEÆ.

Dendrobium tetragonum, *A. Cunn.*
„ linguiforme, *Sw.*
„ Mortii, *F.v.M.*
Sarcochilus divitiflorus, *F.v.M.*
„ Hillii, *F.v.M.*
Pterostylis ophioglossa, *R. Br.*
„ acuminata, *R. Br.*
Glossodia minor, *R. Br.*

ORDER SCITAMINEÆ.

Alpinia cærulea, *Benth.* (Native Ginger.)

ORDER AMARYLLIDEÆ.

Curculigo ensifolia, *R. Br.*
Hypoxis hygrometrica, *Labill.*

ORDER DIOSCORIDEÆ.

Dioscorea transversa, *R. Br.* (Yam.)

ORDER LILIACEÆ.

Rhipogonum album, *R. Br.*
Dianella lævis, *R. Br.*

Eustrephus latifolius var. angustifolia
Cordyline terminalis, *Kunth.* (Lily Palm.)
Iphigenia indica, *Kunth.*
Thysanotus tuberosus *R. Br.* (Fringe Violet.)
Cæsia vittata *R. Br.*
Tricoryne elatior, *h. Br.*
Laxmannia gracilis, *R. Br.*

ORDER PHILYDRACEÆ.

Philydrum lanuginosum, *Banks.*

ORDER XYRIDEÆ.

Xyris complanata, *R. Br.*

ORDER COMMELYNACEÆ.

Commelyna cyanea, *R. Br.* (Blue Spiderwort)
Aneilema gramineum, *R. Br.*
Pollia macrophylla, *Benth.*

ORDER FLAGELLARIEÆ.

Flagellaria indica, *Linn.*

ORDER JUNCACEÆ.

Xerotes longifolia, *R. Br.*
„ multiflora, *R. Br.*
Xanthorrhæa arborea, *R. Br.* (Grass-tree.)
Juncus communis, *E. Mey.* (Common rush.)

ORDER PALMÆ.

Archontophœnix Cunninghamii, *Wendl. et Drude.*
Livistona australis, *Mart.*

ORDER AROIDEÆ.

Typhonium Brownii, *Schott.*
Gymnostachys anceps, *R. Br.*

ORDER NAIADEÆ.

Triglochin procera, *R. Br.*

ORDER ERIOCAULEÆ.

Eriocaulon Smithii, *R. Br.*

ORDER CYPERACEÆ.

Kyllinga cylindrica, *Nees.*
Cyperus polystachyus *Rottb.*
„ difformis, *Linn.*

Cyperus fulvus, *R. Br.*
„ exaltatus, *Retz.*
Heleocharis cylindrostachys, *Bœcket.*
Fuirena glomerata, *Lam.*
Gahnia aspera, *Spreug.*
Scleria Brownii, *Kunth.*

ORDER GRAMINEÆ.

Paspalum scrobiculatum, *Linn.*
Panicum sanguinale, *Linn.*
„ parviflorum, *R. Br.*
„ leucophœum, *H. B. et K.*
„ semialatum, *R. Br.*

In tropical Queensland, Dr. Lumholtz found that the white cockatoos rooted up this grass to feed on its thickened root-stock.

Panicum effusum, *R. Br.*
„ crus-galli, *Linn.*
Oplismenus compositus, *Beauv.*
Setaria macrostachya, *H. B. et K.*
Arundinella nepalensis, *Trin.*
Imperata arundinacea, *Cyrs.* (Blady grass.)
Heteropogon contortus, *Rœm. et Schult.* (Bunch Spear grass)
Andropogon pertusus, *Willd.*
„ intermedius, *R. Br.*
„ refractus, *R. Br.*
„ lachnatherus, *Benth.*
Chrysopogon parviflorus, *Benth.*
Anthistiria ciliata, *Linn.* (Kangaroo Grass.)
Aristida ramosa, *R. Br.*
„ calycina, *R. Br.*
Sporobolus indicus, *R. Br.*
„ diander, *Beauv.*
Cynodon dactylon, *Pers.* (Common Couch-grass.)
Chloris divaricata, *R. Br.* (Star-grass.)
Eleucine indica, *Gærtn.* (Crab-grass.)
Eragrostis Brownii, *Nees.* (Common Love-grass.)

ORDER LYCOPODIACEÆ.

Azolla rubra, *R. Br.* (Red Water-moss.)

ORDER MARSILEACEÆ.

Marsilea hirsuta, *R. Br.* (Water Clover.)

ORDER FILICES.

Ophioglossum vulgatum, *Linn.* (Adder's-tongue Fern.)
Gleichenia flabellata, *R. Br.* (Fan Fern.)
Todea barbara, *T. Moore.*
Alsophila, australis, *R. Br.* (Common Tree Fern.)
Davallia dubia, *R. Br.* (Mountain Bracken.)
Adiantum æthiopicum, *Linn.* (Small Maiden-hair Fern.)
„ hispidulum, *Sw.* (Rough-stalked Maiden-hair Fern.)
„ formosum, *R. Br.*
Cheilanthes tenuifolia var. Sieberi. (Curly Fern.)
Pteris falcata, var. nana. (Ear-fern.)
„ „ var. paradoxa.
„ longifolia, *Linn.*
„ incisa, *Thunb.* (Bats-wing Fern.)
Blechnum serrulatum, *Rich.*
„ cartilagineum, *Sw.*
Doodia aspera *R. Br.* (Prickly Fern.)
„ „ var. caudata.
Asplenium nidus, *Linn.* (Bird's-nest Fern.)
Aspidium molle, *Sw.*
„ decompositum, *Spreng.*
Polypodium tenellum, *Forst.*
„ serpens, *Forst.*
„ confluens, *R. Br.*
„ irioides, *Poir.*
Platycerium grande, *J. Sm.* (Stag's-horn Fern.)

NEW QUEENSLAND LIZARDS.

BY

C. W. DE VIS.

MYOPHILA. *n.g.* *GYMNOPHTHALMIDÆ.*

SCALES keeled. Toes $\frac{4}{5}$. Ears exposed. Head conical. Supranasals none. Nasals small, oval. Eyelid rudimentary. Enlarged preanals four.

MYOPHILA VIVAX.—Rostral broad, rounded, moderately high, on a level with the nasal. Nostril oblique, oval, in the middle of a similar small shield. Post-frontals approximate. Four supraorbitals. Labials $\frac{6}{6}$. Mental short, unpaired shield behind it large, with a diminishing sequence of three behind it. Scale rows 32. Scales of back bi- of neck tri- of occiput penta-carinate: of lower surface and head smooth. Ear with a large projecting scale on the front edge, and a fringe of smaller scales on the hinder edge. Tail with a central row of very broad hexagonal scales beneath. Rudiment of eyelid on the fore and upper edge of orbit. Teeth short, obtuse, regular. Sequence of toes $\frac{1 = \quad 4 \quad 2 \quad 3}{1 \quad 2 \quad = 4 \quad 3 \quad 5}$. Colour above olive brown, head dotted with black. Longitudinal series of dots, black before and white behind on the back, the two mesial series pretty regular, and continued on the tail, the others rather irregular. From the nostril through the ear to the groin a bright white line. Above it, on the edge of the back, a fainter and less defined one from the neck, broadly interrupted (or continuous) on the middle of the body, continued nearly to the tip of the tail. Beneath white, abdomen light blue. Total length, 4 inches 8 lines; trunk, 1 inch 8 lines; head, $3\frac{1}{2}$ lines; fore-limb, 6 lines; hind limb, 9 lines; between the limbs, 11 lines. Locality, Brisbane and neighbourhood.

LYGISAURUS. *n.g.* *GYNOPHTHALMIDÆ.*

Scales smooth, keelless. Toes $\frac{4}{5}$. Ears exposed. Head conical. Rostral broad. Supranasals, none. Nasal sublenticular. Prefrontal single. Postfrontals widely separate.

LYGISAURUS FOLIORUM.—Rostral low, with its hinder edge rather concave. Prefrontal long, with an almost straight front edge,

and an obtuse truncated hinder angle. Postfrontals separated by about their own breadth. Supraorbitals four. Supraciliaries six. Labials $\frac{8}{7}$, the posterior ones ill defined. Teeth short, triangular, sharp, irregular in size, without canines. Scale rows in the middle of the trunk 28. Scales of throat large, graduating in size to the vent. Sequence of toes $\frac{1\ 4\ 2\ 3}{1\ 2\ 5\ 3\ 4}$. Nostril much nearer to the tip of the snout than to the eye. Two preoculars, the upper one very small. Two frenals. Colour: head bronze-brown, a little freckled with black. Body bronze-brown, with steel-blue reflections, each scale light-centred and dark-edged. Below bronze-blue, each scale with a darker centre, becoming black on the scales in a line from the angle of the mouth to the root of the fore limb. Chin flesh-white. Tail beneath as above. Each labial with a black centre. A trace of a dark band from the nostril through and beyond the eye, and of a white line curving under the eye. Total length, 1 inch 5 lines; tail, 9½ lines; head, 2¼ lines; fore limb, 2½ lines; hind limb, 3 lines. Locality, Brisbane. Collected by Mr. H. Tryon. Habitat among fallen leaves. Mr. Tryon notices its wriggling gait (lugisma.)

The introduction of these genera among our gape-eyed scincs leads one to take a synoptical view of the family

GYMNOPHTHALMIDÆ.

Eyes naked, the eye-lids being rudimentary or absent, limbs 4 weak, toes variable, nostril in a single or divided lateral plate, no femoral pores

- **Head conical**
  Rostral rounded
  - **Scales keeled**
    Toes $\frac{4}{5}$
    MYOPHILA
  - **Scales smooth**
    - **Toes $\frac{5}{5}$**
      CRYPTOBLEPHARUS
    - **Toes $\frac{4}{5}$**
      - **Ears hidden**
        MENETIA
      - **Ears exposed**
        LYGISAURUS
    - **Toes $\frac{4}{4}$**
      MICULIA
    - **Toes $\frac{3}{3}$**
      PHANEROPIS
- **Head wedge-shaped**
  Rostral produced
  Toes $\frac{2}{3}$
  LERISTA

THE SENSE OF HEARING IN ANTS

BY

REV. E. C. SPICER, M.A.

IN Sir John Lubbock's interesting papers upon the habits of Ants read before the British Association and in several other Addresses which he has given upon the subject, he expresses doubts amounting, as he thinks, almost to a certainty that Ants have no sense of hearing; or if they have any perception of sound it must be of a very rudimentary character.

"Approaching an Ant," he says "which was standing quietly, I have over and over again made the loudest and most shrill noises I could, using a penny pipe, a dog whistle, a violin, as well as the most piercing and startling sounds I could produce with my own voice without effect." Sir John Lubbock does not infer from this that Ants are really and absolutely deaf, but he evidently thinks that if they hear at all, they hear sounds that are inaudible to us. Not that this circumstance is of great moment, for he continues, "The Universe is probably full of music which we cannot perceive." Sir John has discovered moreover in the antennæ of Ants certain curious organs which may be of an auditory character. "These organs consist of three parts, a small spherical cup opening to the outside, a long narrow tube, and a hollow body shaped like an elongated clock weight. They may serve to increase the resonance of sounds, acting in fact, to use the words of Prof. Tyndall who was good enough to look at them with me, "like microscopic stethoscopes.'"

It will be seen then that Sir John first considers Ants to be incapable of hearing very loud sounds, and secondly that if they have any perception of sound at all, it must be of sound that is too minute for human ears. In short that if they hear at all, they cannot hear what we can, while we cannot hear what they can.

With regard to the first, it is perhaps sufficient to say that there are certain people who are unable to hear the deepest thunder, which is sound of the lowest pitch of vibration; and, again, there are others who cannot hear the squeak of the bat, which is sound of the highest pitch of vibration; while there are possibly other sounds, like the invisible portion at the end

of the spectrum, which no one has ever heard. So that it is not conclusive against the sense of hearing in Ants that they are undisturbed by the violin, the loud shout, and the boatswain's whistle. For if they cannot hear these sounds they at least may hear others of a different character.

But neither is it necessary to suppose that they cannot perceive sounds that are more than microscopic. It seems to be allowed from the adaptability of any organ or set of organs to the circumstances surrounding it, that the discovery of one-half hinge, so to speak, pre-supposes the existence of something corresponding to it. For example, the lungs and the wings of the bird have the air to match them, while the gills and the fins of the fish have the water to match them. And in the same way if any animal can produce sound it has organs of hearing to perceive those sounds, so that when we find reptiles in past geological eras with lungs and eyes we infer at once that there was both air and light at the earth's surface at that time; and by this process of inductive reasoning we conclude that if any animal has ears there must have been sound for it to hear, and if any animal can produce sound, the sound is perceived by some organs without it.

And from observation we are justified in concluding that the sound which any animal makes is perceived and understood best by its own species. For example, the cow has a distinctive note when calling its calf, and even a caressive murmur when fondling it, which the calf understands quite as well as the bull understands the roar of the other bull's challenge, while these things pass by the grazing horse and sheep as the idle wind, which they regard not. And it is the same with birds, their cries of terror or pleasure are perfectly understood by members of their own species. Even as I have seen a flock of ducks rise at some startled cry of their own species and fly up from a lot of cormorants who stood craning their stupid necks from side to side ignorant of the cause of all this fussy flight.

So with the cat, we are well aware that our nocturual friends reserve their loudest profanity for each other.

It is the same with insects. The cicada calls to its fellows. The cricket seeks its mate by its own peculiar chirp. And it seems as if all the faculties of each order, family, genus, and species of animals were designed with reference to those of its own kind almost exclusively.

I mention this to remove all difficulty from what I am about to say. I have not found any well defined ear in the Ant. But I have discovered an Ant which Prof. M'Coy tells me is un-

named that can produce a distinct and peculiar sound, quite easily heard 3 inches from the human ear, so that I think we are justified in concluding that the Ants of that species at least can perceive sounds which do not belong exclusively to the hidden music of the universe, but to the ordinary flats and sharps of daily live.

The Ant is solitary in its habits; like the Bull-dog or Soldier Ant, it lives in a community inhabiting a single hole. It is rather large in size, being over half-an-inch in length, is intensely hard, in most parts of Australia intensely black, but in Queensland the abdomen has a slightly reddish hue. It is timid in its habits, for when touched it curls its abdomen under it and runs away very fast, giving rise to the schoolboy's name of "Scrinch Ant." There are a few around Brisbane. I have seen holes upon One-tree Hill, and the accompanying specimens I found in a paddock beyond the Hospital. The nest is peculiar, the opening of the hole small; but there are many large underground chambers, one being very near the surface, a wide low broad chamber where the pupæ are carried on warm days for the purpose of hatching, being thus protected from the too severe rays of the sun. They are strong and active in habits. Their holes are found strewed with the carapaces of very large beetles, so that if a man were strong in proportion, two or three of us could easily drag a dead elephant.

If seized by the back and held in the air they make angry efforts to bite and sting; failing this they become distressed, and the rings of the abdomen are seen to be in rapid motion, when if they are held near the ear a series of rapid jerky, hissing, and chirping sounds is heard quite clearly. Upon examining the abdominal rings it is found that the proximal and second are largely developed, and the joint between them much wider than usual, the under surfaces are roughened and the sound is evidently made by the rapid motion of one ring inside the other, thus producing the sound which is no doubt heard by members of the same species by means of some organs, which, possibly, might be more easily discovered in this species by a skilful anatomist. It would be extremely interesting if this fact could be settled by Australian observation.

NOTES.

On Deglutition in the Fresh-water Snake.—In some snakes, notably in the constrictors, the process of deglution has been watched, the means accounted for; but I do not find that any record of the mode of swallowing in our fresh-water snake, Tropidonotus picturatus, has hitherto been made. It is indeed hardly probable that this reptile has ever fed under close observation, it may therefore add a mite to the sum of knowledge if we make use of opportunities afforded by an individual in captivity to render an account of it. It differs much, I may say essentially, from that natural to the constricting snakes. In the Boas and Pythons the process is said to be wholly dependent on the action of the jaws. They consist of six longtitudinal arches of bone closely beset with backwardly curved teeth, one pair forming the edges of the upper jaw, another pair the palate, the third the lower jaw, all loosely connected and each served by muscles of its own, capable of pulling it forward or backwards. The snake having taken its lifeless victim in its gape prepares to swallow it, unfixes one of its six jaws and pushing it forward a little refixes it, then releases the next jaw and carries it forward, thus it puts in motion the whole of its jaws in succession, the first still advancing as the others follow: the result obviously being that in the words of our authority, Professor Owen, 'by their successive movements the prey is slowly and spirally introduced into the wide gullet.' But careful observation has so far failed to detect similar movements of the jaws in the fresh-water snake. Seizing a frog by any part of the body it proceeds at once to swallow it alive and it is in the neck that the first movement to that end is perceived: commencing at the head on one side it is seen to rise rapidly forward step by step, while on the other side it is falling similarly backwards. The purpose seems to be that of suction. By the frequent repetition of the act the prey is drawn in to a slight degree and then the advantage obtained is secured by the simultaneous advance of the jaws on the body of the victim: thus little by little the prey disappears in a straight line inwards. As soon, however, as a sufficient surface of its body has passed beyond the jaws it is subjected to the direct application to it of the muscular walls of the neck, and it is carried or rather stroked downwards more actively if, not more expeditiously. The muscular movements

become more distinctly undulatory the wave proceeding from one side to the other. The elevators of the ribs on one side are vigorously raising each rib in succession from the head backwards for some little distance: the retractors of the ribs on the other are successively depressing them, and a sliding grasp is thus brought to bear upon the substance within which becomes constantly more effectual as more surface and more augularities are presented to it. At length the prey enters wholly within the gullet: the peristaltic action has now full effect upon it and it is passed rapidly down in a direct course till it reaches the stomach.

C. W. De Vis.

TUESDAY, 10th June, 1884.

L. A. Bernays, Esq., F.L.S., etc., in the Chair.

The following donations were announced :—

1. Illustrated Catalogue of Locomotives, Baldwin Locomotive Works. Philadelphia, 1881. From A. Norton, Esq.

2. "The Midland Medical Miscellany," Vol. 3, No. 28. Leicester, &c., 1884. Anon.

3. "Atti della Società Toscana di Scienze Naturali." Processi verbali, Vol. IV. 13 gennaio, 1884. From the Society.

4. "Bericht des Vereines für Naturkunde zu Cassel." XXIX. und XXX. Kassel, 1883. From the Society.

5. Proceedings of the Linnean Society of New South Wales, Vol. IX., Part 1. Sydney, 1884. From the Society.

6. "Transactions de la Société Royale des Arts et des Sciences de Maurice," Vols. XI-XIII. Mauritius, 1883. From the Society.

The following papers were read:—

CONTRIBUTIONS TO THE QUEENSLAND FLORA.

PART II.

BY

F. M. BAILEY, F.L.S., GOVERNMENT BOTANIST.

(PLATE XIV.)

This Contribution to our Flora, forming a Second Supplement to my work "Synopsis of the Queensland Flora," contains forty-eight species, nineteen of which are Dicotyledons, nine Monocotyledons, and twenty Acotyledons.

Amongst the dicotyledons the most notable are the Syncarpia of Fraser's Island, which I consider new, and have, therefore, named after Mr. Walter Hill, who was, I believe, the first to draw attention to it as a valuable timber. The tree, in its native state, so far as at present known, is peculiar to Fraser's Island, where the soil is largely composed of sand; but from the appearance of some in the Wickham Terrace Reserve, which were raised from seed and planted there a few years ago by Mr. Hill, this Syncarpia seems to be adapted also for hard dry rocky soils, a feature worthy of note since sooner or later attention must be turned to Forest Planting in this colony also, as in other parts of the globe. Another tree belonging to the same natural order, Myrtaceæ, viz., Eugenia eucalyptoides, is deserving of consideration also. Fruit of this was forwarded a few years since from Cooktown to Mr. A. J. Hockings, under the name of "Native Pear." The tree bears a handsome fruit, which may be used for the same purposes as the "Rose Apple," but as it is moreover of most graceful habit, it will be, perhaps, more suitably grown for scenic effect than either for its fruit or timber.

Amongst the Monocotyledons I would draw attention to the new orchid Bulbophyllum purpurascens, received from Mr. J. W. R. Stuart, of the Herberton and Mourilyan Harbour Railway Survey. I take this opportunity also of acknowledging my indebtedness to this gentleman for several other plants of

this order, which are growing in the Botanic Garden, and will be described as they come into bloom. Amongst the Acotyledons will be found several new Lichens, for the determination and drawing of which I am indebted to Dr. Chas. Knight, a Lichenologist of world-wide reputation.

The list is further enriched with additional fungi, identified by Mr. C. E. Broome, the celebrated Mycologist, and by the enumeration of several plants extracted from Baron von Mueller's "First Annual Supplement to the Systematic Census of Australian Plants."

ORDER CARYOPHYLLEÆ.

Polycarpæa, *Lour.* (Section Planchonia) longiflora, *F.v.M.*
Hab. Northern Queensland, Frank H. Hann.

Polycarpæa (Section Planchonia) Burtoni, *Sp. Nov.*

Stems several, 9 to 12 in. high, erect from a hard woody base, slightly silky pubescent. Leaves, those of the base linear-spathulate, and about 1 in. long, the stem ones very narrow almost filiform, and about $1\frac{1}{2}$ in. long with bristle-like points. Flowers in terminal dense corymbs. Sepals narrow-lanceolate 3 to 5 lines long, scarious pinkish, with a deep-purplish colored midrib. Petals united with the stamens in a tube about $2\frac{1}{2}$ lines long, purple, the free parts about the same length and more or less lobed; filaments very slender, and with the free parts of the petals reflexed after flowering. Style shortly lobed at the end. Capsule fusiform. Seeds numerous.

Hab. Walsh Range, between the Tate River and Thornborough, R. C. Burton; between Herberton and Mourilyan Harbour, J. W. R. Stuart.

Perhaps when better known this with P. spirostyles, and P. synandra may be found only forms of one species.

ORDER MALVACEÆ.

Abutilon leucopetalum, *F.v.M.*
Hab. Queensland, in Mueller's Suppt. to Census of Austr. Plants.

ORDER TILIACEÆ.

Triumfetta Winneckeana, *F.v.M. 1st Suppt. Census of Austr. Pls.*
Hab. Queensland, Mueller l.c.

ORDER RUTACEÆ.

Phebalium elatius, *Benth. (Eriostemon elatior F.v.M).*
Hab. Queensland, in Mueller's Suppt. to Census of Austr. Plants

ORDER RHAMNEÆ.

Pomaderris elliptica, *Labill.*
Hab. Queensland, in Mueller's Suppt. to Census of Austr. Plants.

ORDER LEGUMINOSÆ,

Daviesia acicularis, *Sm.*
Hab. Queensland, in Mueller's Suppt. to Census of Austr. Plants.
Crotalaria crispata, *F.v.M.*
Hab. Queensland, in Mueller's Suppt. to Census of Austr. Plants.
Indigofera haplophylla, *F.v.M.*
Hab. Queensland, in Mueller's Suppt. to Census of Austr. Plants.

ORDER HALORAGEÆ.

Haloragis teucrioides, *A. Gray.*
Hab. Logan River (Rev. B. Scortechini).

ORDER MYRTACEÆ.

Syncarpia Hillii, *Sp. Nov.*

A tall tree with a thick somewhat fibrous deeply-furrowed, reddish bark, and perfectly glabrous foliage.

Leaves opposite, but the pairs in places often so close together as to appear in whorls of 4, ovate, to ovate-lanceolate, shortly acuminate, rounded at the base, 4 to $6\frac{1}{2}$ in. long, 2 to 4 in. broad, deep green on the upper side, paler beneath, costa prominent, the transverse veins anastomosing in an intramarginal one some distance from the margin, both sides finely reticulate; petioles nearly terete when fresh, much wrinkled when dry, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. Flowers united in heads, usually a whorl of six with one in the centre, peduncle terete (angular in the dry state), $\frac{3}{4}$ to $1\frac{1}{4}$ in. long, with broad scale-like bracts close under the head. Calyxes connate at the base, the free part campanulate, lobes obtuse often reflexed, Petals orbicular, with undulate thin margins. Stamens in 2-rows inflexed in the bud, 3 to 5 lines long, filaments flattened. Anthers nearly globular. Fruiting heads 1 to $1\frac{1}{2}$ in. diameter, ovary flat-topped glabrous, 3 celled. Seeds linear erect from the thickened axile placenta. Hab. Fraser's Island.

This noble tree was found by Mr. W. Hill, on Fraser's Island, a few years ago, and on account of the valuable nature of the timber for Railway purposes, the portion of the Island where it grew was proclaimed a reserve. This Island tree differs from its close ally S. laurifolia principally in being larger in all its parts and perfectly glabrous, which distinctive characters are retained in cultivation.

Eugenia hemilampra, *F.v.M.*, *Fragm IX.*
Hab. Nerang Creek (Rev. B. Scortechini).

Eugenia eucalyptoides, *F.v.M.*
Hab. Cook District. T. Barcley Miller.

The seed of this tree was sent from Cooktown in January, 1878, by Mr. T. B. Miller, under the name of "Native Pear," he having gathered the fruit off some trees growing along the Telegraph Line about 90 miles from Cooktown. From these seeds Mr. Hockings raised several plants, one of which is now bearing. The fruit, in a measure, deserves the name given to it by Mr. Miller, as it is something like a pear in shape, and is rosy-colored or bright red on the side exposed to the sun. In foliage it is not unlike the small Eucalypt of the Murray River called E. gracilis, *F.v.M.*

Mr. Hockings has kindly given me the following description:—
"The fruit fits closely around one large round seed, not loosely as in the Rose Apple, is *solid*, resembling the flesh of a tender apple, not cellular like the Rose Apple; thickness of fruit around the seed in the specimen noticed (a shrivelled one) about $\frac{3}{16}$ of an inch. Flavor agreeable, slightly acid, and having a marked and pleasant aromatic taste."

ORDER COMPOSITÆ.

Lagenophora Emphysopus, *Hook. f.*
Hab. Queensland, in Mueller's Suppt. to Census of Austr. Plants.

Helipterum Dimorpholepis, *Benth.*
Hab. Queensland, in Mueller's Suppt. to Census of Austra. Plants.

ORDER UMBELLIFERÆ.

Hydrocotyle pedicellosa, *F.v.M.*
Hab. Tambourine Mountain (Rev. B. Scortechini).

ORDER ASCLEPIADEÆ.

Dischidia Rafflesiana, *Wall.*
Hab. Queensland, in Mueller's Suppt. to Census of Austr. Plants.

Hoya Keysii, *Sp. Nov.*

A succulent climber clothed with a short white pubescence, except the upper surface of the adult leaves. Leaves ovate-cordate 1 to $1\frac{1}{2}$ inches long, $\frac{3}{4}$ to 1 inch wide, thick, fleshy, prominently penninerved; conspicuously anastomosing within the margin. Inflorescence pubescent. Peduncles 6 to 9 lines long, bearing an umbel of 12, or more flowers, on slender pedicels of 6 to 9 lines. Calyx-segments about a line long. Corolla

spreading to about $\frac{1}{2}$ an inch wide, the segments acuminate, inflexed after flowering. Corona segments with horizontally spreading laminæ, very obtuse on the outer margin, the inner margin acuminate and the back with two sharp keels as in H. Australis.

Hab. Mount Perry, climbing over rocks (Jas. Keys).

This species differs from H. Australis, principally in the pubescence, and shape of leaves. From the specimen sent it would seem to be a free-flowerer.

ORDER LENTIBULARIEÆ.

Utricularia biloba, *R. Br.*

Hab. Queensland, in Mueller's Suppt. to Census of Austra. Plants.

ORDER ORCHIDEÆ.

Dendrobium Taylori, *F.v.M. Fragm. VIII, as a Bulbophyllum; Dendrobium uniflos, Bail. Trans. R.S.Ql., Vol.* 1, *p.* 12.

Hab. Blomfield River (Norman Taylor). Herberton (J. W. R. Stuart).

Bulbophyllum punctatum, *Fitzg. in Britten's Journ. of Bot.*, 1883.

Hab. Queensland, in Mueller's Suppt. to Census of Austr. Pl.

Bulbophyllum clavigerum; *Cirrhopetalum clavigerum, Fitzgerald in Britten's Journal of Botany*, 1883.

Hab. Queensland, in Mueller's Suppt. to Census of Austr. Pl.

Bulbophyllum purpurascens, *Sp. Nov.*

Rhizome creeping, forming dense matted patches. Pseudobulbs about 1 line long, often so close together as to give the rhizome a moniliform appearance, the scarions sheathing scales prominent, leaves 5 to 12 lines long, deep green, thick channeled above the back convex tapering at the base into a short stalk above the pseudobulb.

Peduncles erect, numerous filiform 6 to 12 lines long, with several white scarious bracts at the base and close under the solitary purplish flower.

Lateral segments or sepals about 2 lines long, striate with 3 to 7 dark lines, broad lanceolate, obtuse, or the dorsal one emarginate, the oblique base adnate to the basal projection of the column forming a short pouch; inner segments or petals purplish, about $1\frac{1}{4}$ lines long, 1-nerved, narrow lanceolate, point elongated, and margins glandular-ciliate. Labellum clawed 2 lines long, dark-purple, lanceolate with fringed margins, two lobed at the base, and a raised rib along the centre. Column

white, short, the prominent wings ending in elongated points. Capsule, oblong ribbed, about 3 lines long and $1\frac{1}{2}$ lines diameter.

This pretty species was found growing on rocks between Herberton and Mourilyan Harbor, by J. W. R. Stuart.

Bulbophyllum Bowkettæ,* *Sp. Nov.*

Rhizome creeping and forming dense patches. Pseudobulbs oval-oblong, compressed, bluntly ribbed, 3 to 5 lines long, 2 to $2\frac{1}{2}$ lines broad. Leaves solitary on the pseudobulbs, thick, dark-green, ovate to suborbicular, 4 to 6 lines long. Flowers solitary on scapes of about 4 lines long, articulate about the middle just above a minute, obtuse, sheathing bract. Sepals about 2 lines long greenish-yellow, bordered by a purple line, and with three purple lines down the centre, the lateral ones forming a short spur. Petals about half the length of the sepals, with one central purple line. Labellum linear, thick, long as petals, purple, the tip yellowish. Column short the front teeth erect and longer than anther. Capsule not seen.

Hab. On trees between Herberton and Mourilyan Harbour. (J. W. R. Stuart.)

Cleisostoma Keffordii, *Bail. in Rep. Ql. Acclimatisation So., April*, 1884.

Hab. Johnstone River. W. R. Kefford.

Pterostylis grandiflora, *R. Br.*

Hab. Mount Perry. James Keys.

Chiloglottis trilabra, *Fitzg. in Britten's Journal of Botany*, 1883.

Hab. Queensland, in Muller's Supot. to Census of Austr. Plants.

ORDER CYPERACEÆ.

Cyperus flavidus, *Retz.*

Hab. Queensland, in Muller's Suppt. to Census of Austr. Plants.

Cyperus tenuiflorus, *Rottb.*

Hab. Queensland, in Muller's Suppt. to Census of Austr. Plants.

ORDER FILICES.

Acrostichum Taylori, *Bail. in Rep. of Ql. Acclimatisation So., April*, 1884.

Hab. on wet rocks, Johnstone River. W. R. Kefford.

ORDER MUSCI.

Dawsonia superba, *Grev ; Fl. N.Z.*

Hab. fine specimens of this magnificent moss have been lately collected by Mr. H. Schneider near Nerang Creek.

* The specific name is in honor of a lady who has painted most faithfully, some of these small flower Queensland Orchists.

ORDER LICHENES.

Usnea angulata, *Hook et Tay.*
Hab. On trees Taylor's Range. (Bailey.)

Alectoria, *Ach.*

A. australiensis, *C. Knight. Sp. Nov.*

Thallus atrofuscus filiformis, filis longissimis *teretibus* lævis *non-lacunosis* infra nonnihil conjunctim tortis, supra remoté divergenti-ramosis Apothecia non visa. C. K., 8-4-84.

Thallus filiform, dark-brown, nearly black, the thread-like branches tortuosely anastomosing in the lower part, the ultimate branches divergent, all terete not lacunose. Hab. Taylor's Range (Bailey.) Nerang Creek, very fine (H. Schneider).

Dr. C. Knight remarks that the present species greatly resembles *A. Fremontii, Tuck,* being as dark in colour and as much elongated but more remotely branched and quite terete, the Queensland specimens were not in fruit, but Alectoriæ are rarely fertile.

Physcia leucomela, *Mich.* var. angustifolia, *Mey. et Flot.*
Hab. Nerang Creek (H. Schneider).

Pannaria sorediata, *Knight.* (Pl. xiv. fig. 1.)

Thallus rubiginoso-glaucescens foliosus lobatus, lobis latis crenatis adscendentibus, undulatis venatis (venulis subtilibus), marginibus sorediatis, subtus tomentosus atrofuscus. Apotheciorum disco luteorubro, margine thallode crasso erecto sorediato, sorediis albocinereis, paraphysibus adglutinatis (prosenchymatis ?) Sporæ (fig. 1. a. and b.) ellipsoideæ nonnihil orbiculares crasse limbatæ incolores longit. 0.014 mm. crassit. 0.009 mm.

Supra muscos v. ad cortices arborum.

Allied to *P. rubiginosa*, but a much larger, coarser lichen.

Thallus of a reddish-grey color, leafy, the lobes broadly crenate ascending, wavy veined with the margins sorediate, the undersurface dark-brown. The apothecia with a reddish-yellow disk, thalline border thick, erect and sorediated Paraphyses adherent. Spores (fig 1. a. and b.) elliptical or sometimes orbicular, with broad continuous margins .014 mm. long. .009 mm. broad.

Hab. On moss and bark, Pimpama (W. B. Bailey).

Thelotrema megalophthalmum, *Muell. Arg.*
Hab. On bark of trees, Main Range (C. H. Hartmann.)

Strigula nemathora, Fée (Pl. xiv. fig. 2). In referring to some beautiful specimens of this species, which were found growing on the leaves of Magnolia grandiflora, in Mr. Hockings' Nursery,

South Brisbane. Dr. Knight makes the following remarks:—"It is a beautiful object under water, protected by a thin glass cover, with 1½ inch object-glass. (Fig. 2; a.) It agrees closely with one collected by Dr. Schweinfurth in the country of the Niam Niam, in central Africa (Schw. 2969; Arnold's Exsicc. No. 818.) I possess another specimen collected in tropical South America by Spruce, No. 640. The last mentioned has the margins of the laciniæ regularly toothed. This, however, is not the case with the Queensland Lichen; altho' it would be seen in the accompanying diagram that three or four teeth are sometimes found on the edge of the laciniæ (fig. 2, b.) The long hairs (fig. 2, c.) bearing at their apex remarkable capitula containing endochrome, are very numerous, but are scarce in the South American specimen. The silvery glistening appearance of *S. Nemathora*, under the microscope, is due to the pennate veined structure of the laciniæ, which reflects the light in a remarkable manner. Hence, probably, Fée's name, *Nematora argentea.*"

Verrucaria (Porina) Baileyi, *C. Knight*, sp., n. (Pl. xiv.; fig. 3.)

Thallus subnitidulus e fusco-olivaceus tenuis (crassit circiter, 8 mm.) verrucosus continuus, in sectione perpendiculare (fig. 3, a.) strato gonimico viridi ab corticali translucente clare separato. Verrucæ fertiles convexæ monopyreniæ, ostiolo aperto nigricante instructæ; hymenium incolor in matrice omnino immersum, excipulum globosum a thallo carbonizatoformatum, paraphysibus distinctis subtilissimis numerosis. Sporæ (fig. 3, b.) in ascis cylindraceis oblongæ utrinque obtusæ mox fuscidulæ 4-cellulæ, cellulis lenticularis, nonnihil subquaternis, emortuæ fuscescentes-longit. 0.25 mm. crassit. 0.01 mm.

Ad cortices arborum.

Thallus thin of an olive-brown. Paraphyses distinct, very slender and numerous. Spores (fig. 3, b.) in cylindrical asci, obtuse at both ends, 4-celled, .025 mm. long., .01 mm. broad. Hab. On bark, Helidon (Bailey.)

ORDER FUNGI.

Agaricus (Lepiota) megalotheles, *Rev. C. Kalchb, Proc. Linn. Soc., of N.S.W.; Vol. VII.*

Hab. Endeavour River (Persieh.)

Agaricus (Lepiota) rhytipelta, *Rev. C. Kalchb, et F.v.M., Proc. Linn. Soc., N.S.W.; Vol. VII.*

Hab. Rockhampton (Madame Thozet.)

Lentinus Kurzianus, *Currey*, *Linn. Trans.*, 1876. *Ser. II.*, *Vol. I.* 120.
Hab. Johnstone River (A. E. Miskin).

The above differs from those collected by Mr. Sulpiz Kurz, in Pegu in that they are larger, and the gills more distinct. *C. E. Broome.*

Polyporus (Anoderma) ochroflavus, *Cooke.*
Hab. Three Mile Scrub, Enoggera (Bailey.)

Polyporus (Pleuropus) lucidus, var. exquisitus, *Rev. C. Kalchb, Proc.* Linn., N.S.W. ; Vol. VII.
Hab. Endeavour River. (W. A. Persieh.)

An intermediate species between P. lucidus and P. japonicus *Fries.*

Puccinia Rumicis.
Hab. On Dock leaves, 3-mile scrub, Enoggera (Dr. Bancroft.)

Sphærotheca pannosa, Lév.
Hab. On Roses, Brisbane Gardens, during the past season (Bailey).

Peziza Colensoi, *Berk. in Fl. N. Z.*
Hab. On wood, Main Range (C. H. Hartmann).

Cercospora cladosporioides, *Saccardo*, *Fungi Ital.*
Probably this, on leaves of Notelæa linearis. Helidon waterfalls (Bailey).

Thamnomyces, *Ehrenb.*

T. hippotrichoides, *Ehrenb.* (Vegetable Horsehair.)
Hab. on dead leaves, &c., Nerang Creek (H. Schneider).

Sphæria (Depazea) Litseæ, *Berk. et Br.*
Hab. On leaves of Litsea dealbata, Queensland Scrubs (Bailey).

ON THE MIGRATION OF BIRDS AT THE CAPE YORK PENINSULA.

BY

KENDAL BROADBENT.

Cape York being the most northern extension of Australia would naturally be the winter residence of birds which, frequenting more southern parts during the summer months, seek a warmer climate on the approach of the cold of winter. Further than this, the Cape York Peninsula helps to bridge over the sea between the two continents of Australia and New Guinea, indicating as it does, the spot where the intervening straits are narrowest, and migratory birds shunning—as is their habit—a broad expanse of ocean, find here a point of departure or arrival in passing from land to land, taking advantage of the numerous islands which stud the passage and form natural resting places for them on their journey. A naturalist placed then at Cape York during the early months of the year, has opportunity for recording useful observations relating to the seasonal movements of birds, and it is in this faith that the following brief notes have been made.

ACCIPITRES.

Aquila audax, Lath., the wedge-tailed eagle, was here in January; but I only saw a solitary individual.

**Haliaetus leucogaster*, Gld., the white-bellied sea eagle, breeds here, as does also **Pandion leucocephalus*, Gld., the white-headed osprey.

CAPRIMULGIDÆ.

**Podargus papuensis*, Quoy and Gaim., the New Guinea goat-sucker, and arrives here from the north about the middle of February.

CYPSELIDÆ.

I found a swift here which I have not previously met with, during some wet weather which was experienced in January and February.

HIRUDINIDÆ.

There are no swallows here during the early months of the year, and only a single species of "Martin" of the colonists, namely: * ***Hydrochelidon nigricans***, Less.

MEROPIDÆ.

* *Merops ornatus*, Lath., the Australian bee-eater, arrived here from the south first on the 14th of February (Mr. Gould in his "Handbook of the Birds of Australia," vol. I, p. 117, mentions that this bird does not leave New South Wales, and places having the same latitude, until March). Captain F. Dyer informs me that he has met with Merops at sea, between Mulgrave Island and the coast of New Guinea, in such numbers, as to cover the yards and deck of his ship.

CORACIDÆ.

Eurystomus pacificus, Lath., the dollar bird, arrived here from the south in March, and a few remained in the district throughout the winter months.

ALCEDINIDÆ.

Dacelo gigantea, Gld., the laughing-jackass, I observed thirty miles inland from here in April.

Syma flavirostris, Gld., the yellow-billed king-fisher, leaves here in the middle of April, or at least the greater part of them do.

Tanysiptera sylvia, Gld., the white-tailed king-fisher, have all left here by the end of March. Mr. F. L. Jardine informs me that in the month of October during the early morning he has met with them here in hundreds, so tired and enfeebled, apparently by their migration, as to refuse to fly out of harm's way, and that on the day previous to this visitation they were nowhere to be seen.

CAMPEPHEGINÆ.

Graucalus Swainsonii, Gld. I observed here during the latter part of March, but they all left in the succeeding month.

DICRURIDÆ.

Chibia bracteata, Gld., the Drongo shrike, leaves here about the middle of April for the south.

* ***Manucodia Gouldi***, G. R. Gray. This bird is most plentiful here during January and February, in March it becomes scarce, and in April it is not to be met with here at all.

MUSCICAPIDÆ.

Sauloprocta picata, Cab., the pied wagtail, was here in April, but I never met with it during the three previous months.

Arses Kaupi, Gld., Kaup's Flycatcher, occurred here during February, but was scarce.

* *Myiagra plumbea*, Vig and Horsf., the lead colored fly-catcher, winters here, and in New Guinea, arriving from the south in March, and not being met with during the previous part of the year.

Myiagra nitida, Gld., the shining fly-catcher, arrives from the south a month earlier than its congener, M. *plumbea*, Vig and Horsf., but is a scarce bird. I have only seen two examples during my stay.

SAXICOLIDÆ.

Pœcilodryas superciliosa, Gld., the white-eyebrowed robin, is a scarce bird here; it is found all the year round frequenting mangrove swamps.

Drymodes superciliaris, Gld., the eastern scrub-robin. This I found both in January and February in the coast scrub, which it entirely deserts during the succeeding two months for more inland districts. I have only met with three of the robin family during my visit.

MERULIDÆ.

Pitta similima, Gld., a variety of the Noisy Pitta *P. Strepitans*, Temm, is plentiful here during January and February, but is not to be met with in March or April, as it goes in-land. which I conclude from having met with it in April, in the scrubs, several miles from the coast.

* *Pitta macklotii*, Temm. This Pitta has the same seasonal distribution as *P. similima*.

STURNIDÆ.

* *Calornis metallica*, Temm., is here literally in thousands throughout January, February, and March, leaving altogether during the first week in April.

CRATEROPODIDÆ.

Pomatostomus. I met with a few individuals of this bird 30 miles inland, but it is undoubtedly scarce.

MELIPHAGIDÆ.

Ptilotis Cockerelli, Gld., was here in January, but I met with none since.

* *Ptilotis notata*, Gld., is plentiful all the year round.

EPIMACHIDÆ.

Ptilorhis paradisea, Swains., the rifle bird. This I did not meet with in the coast scrub, but it occurred inland in April, in very poor plumage.

CUCULIDÆ.

Lamprococcyx plagosus, Lath., the bronze cuckoo, was here during March.

* *L. minutillus*, Gld., the little bronze cuckoo, also.

* *Scythrops Novæ Hollandiæ*, Lath., the channel-bill, was also met with during March.

Edynamis F indersi, Lath., the koel. These cuckoos, as well as two other bronze cuckoos, leave here in April.

PSITTACIDÆ.

* *Microglossum aterrimum*, Gmel., the great Palm cockatoo, leaves here in April, in which month I met with it in the scrubs inland from the coast.

Ptistes erythropterus, Gmel., the red-winged lory, was here in January and February, the birds being young and in poor plumage.

Platycercus pallidiceps, Vig., the Moreton Bay rose-hill, I saw on the 16th April. The three birds I met on this occasion were the only ones seen during my visit.

Trichoglossus Swainsonii, Jard. and Selby., the blue-bellied lorikeet, was here during January and February, but their visits are determined by the presence of flowering trees, and are irrespective of seasons.

COLUMBIDÆ.

Ptilinopus Swainsonii, Gld., Swainson's fruit pigeon, does not occur here in January or February, but there are plenty to be met with during April.

* *Lamproteron superbus*, Temm. This fruit pigeon is here in numbers throughout the month of March, but they have all left by the middle of April.

* *Myristicivora spilorrhoa*, G. R Gray, the white Torres Straits pigeon, leaves here by about the middle of March.

* *Lophaimus antarcticus*, Shaw, the top-knot pigeon, was met with during my visit on its way from the north, but the birds were small and their plumage dirty.

Though many of the birds here enumerated are, as far as our imperfect knowledge goes, restricted to Cape York, a very large proportion (which I have marked *) are natives of New Guinea for some part of the year, whilst others extend to the southern colonies, some even as far as New Zealand.

ON NEW SPECIES OF AUSTRALIAN LIZARDS,

BY

C. W. DE VIS, M.A.

MACROPS, *N.G.*

Head long, broad, and flat posteriorly, wide, and elevated between the eyes, suddenly contracting and sloping to the snout; eyebrows hardly keeled, no facial ridge. Back with small subcarinate scales in cross rows and *numerous* larger ones intermixed; ridge-like folds above and below the ear; nape with a low crest continued rudimentarily to the tail. Tail short, tapering, with the keels of the scales above, and for the most part below, in continuous lines; scales of the lower surface subcarinate; throat with a cross fold; femoral and preanal pores? A genus differing from the other genera of the Agamidæ rather in the totality of its characters than in any salient feature.

MACROPS NUCHALIS. A. Gryph. bennettii

The length of the head is $3\frac{1}{2}$, that of the hind limb $1\frac{4}{5}$, of the fore limb $3\frac{1}{5}$, the distance between the limbs 2, in the length of the trunk. Snout $1\frac{2}{3}$ in the interorbit, interorbit $1\frac{2}{3}$ in the length of the head. Tail, a tenth longer than the head and trunk. The profiles of the snout and interorbit convex: postorbital part of the head broad, flat, not distinct from the neck; a keeled fold from below the orbit runs over the ear, and below it a shorter one, also over the ear; a more distinct one from below the angle of the mouth armed with triangular free scales runs under the ear and curves upward towards the shoulder. Paratoids a little swollen. Toes not fringed. Sequence of toes $\frac{1}{1}$ $\frac{5}{5}$ $\frac{2}{2}$ $\frac{3}{3}$ $\frac{4}{4}$, the middle hinder toe much shorter than the third. Throat with a cross fold. The scales of the head to the nuchal crest as large as those of the abdomen, hexagonal when viewed laterally: enlarged scales of the back and some of the others pentagonal, the rest rhombic. Scales of snout carinate, of the rest of the head smooth; of the back and belly subcarinate; nuchal crest composed of six or seven low free scales; the dorsal almost obsolete. A few rows of scales on each side of it form very faint continuous lines. Scales of outer side of fore limb, and both sides of hind limb continuously keeled. General

colour of the back, speckled black, grey, and white, the black and grey intermixed in about equal proportions, the white occupying chiefly the larger scales. Tail, ringed with blackish brown, more distinctly towards the end. On the nape a large oblong patch of brownish red. The arms, breast, and thighs more or less stained with the same: subaural fold white, edged with black above and below. Hinder part of head with black lines and spots assuming the form of ocellations on the sides of the nape.

Length, seven inches. Locality, Delta Station, Bogantungan. Collected by Mr. C. W. de Burgh Birch.

DIPOROPHORA.

Dr. Gray having but one example of the genus before him, limited the number of preanal pores to one on each side. This character appears to be of no more than specific value, if that, since in four lizards not otherwise differing generically from *bilineata*, the pores are from one to three on each side. I have for many years been of opinion that the Diporophora of the central and south coast district is not the one described by Gray from Port Essington, and that conviction having lately become stronger I propose to describe it as

DIPOROPHORA NUCHALIS. = australis

The length of the head is two fifths nearly of that of the trunk: the fore limb and the distance between the limbs are each three-fifths of the same: the hind limb is nearly equal to the trunk in length: the tail $3\frac{1}{2}$ times as long, the snout is $\frac{3}{7}$, and the interorbit $\frac{1}{2}$ of the length of the head. The eye is in the centre of the length of the head, the nostril in the centre of the snout. The head slopes forward rapidly from the vertex, its scales are larger than those of the back, and equal to those of the limbs. There are no spines on the front of the ear. The back has a central as well as lateral keels, but the latter are the stronger. Preanal pores, 2 or 3 on each side. The colour varies from pale brownish yellow to brown, with from five to seven bar-like spots more or less connected transversely on each side of the back, the nuchal band almost constantly ends in a large dark spot on the side of the neck. Top of the head generally reddish, sides of the face and around the ear sometimes blackish or reddish brown.

The lizard is a bold sprightly creature delighting to watch for prey in bare spots of ground in the full sunshine. At such times it may be recognized by its attitude alone: squatting

posteriorly close to the ground it raises its forequarters and elevates its head and snout as high as it conveniently can. The black blotch on the side of the neck is then conspicuous.

DIPOROPHORA ORNATA. = australis

The length of the head is $\frac{5}{11}$, of the hind limb $\frac{7}{6}$, of the fore limb $\frac{2}{3}$ in the length of the trunk: the tail three times and a thirteenth longer than the trunk: the distance between the limbs $\frac{2}{3}$ of the trunk. The head slopes from the vertex forward with a curved profile. The eye is much nearer to the ear than to the tip of the snout, the nostril nearer to the latter than to the angle of the eye. The dorsal ridges are one central, two sub-central, and two lateral. A ridge above and a second below the ear, both faint anteriorly, distinct behind. Preanal pores not distinguishable. The head and mid-line of the back dark brown, the sides of the back and upper surface of the tail grey, the former with six chesnut triangular paler-centred spots descending from the dark median band, upper part of flanks coffee red in a band beginning behind the ear: upper surface of tail ringed: hinder side of thigh with a white streak blacked-edged above and with stains of coffee red above the streak.

DIPOROPHORA BREVICAUDA. = bilineata

The length of the head is $\frac{2}{5}$ of that of the trunk. The fore-limb and the distance between the limbs are each three-fifths of the same. The hind-limb is equal to the trunk in length, the tail $2\frac{2}{5}$ times as long. The snout is $2\frac{2}{3}$, the interobit $1\frac{4}{5}$ in the length of the head. The eye much nearer to the ear than to the tip of the snout—the nostril central between those points. Postmental pair of shields as large as the mental. Ear bordered anteriorly by unkeeled sometimes triangular scales. The keels of the dorsal scales in twelve rows, inclusive of the stronger lateral keel. Preanal pores, one on each side.

Dark grey, without markings; tail, faintly ringed. A distinct pale dorso-lateral band from behind the ear continued interruptedly to the snout. Head sometimes light-brown with a light streak from the nostril to the angle of the mouth: or both streaks may be absent, and the head stained with black, especially on the cheeks.

Length, $7\frac{1}{4}$ inches. Locality, Cape York; collected by Mr. K. Broadbent.

DIPOROPHORA PENTALINEATA. = bilineata

The length of the head is $\frac{2}{5}$ of that of the trunk. The fore-limb $\frac{3}{5}$, the distance between the limbs $\frac{2}{3}$ of the same, the hind

limb is equal in length to the trunk. The tail $3\frac{1}{10}$ times as long. The eye is central; the nostril rather nearer to the tip of the snout than to the eye. The snout is $\frac{2}{5}$, the interorbit, $\frac{1}{2}$ of the length of the head. Postmental pair of shields much smaller than the mental. Ear edged anteriorly with smooth irregular scales; the keels of the dorsal scales in fourteen rows inclusive of the dorsolateral keel, the first row below that keel is also longitudinal. Preanal pores, two on each side.

Reddish-brown to coffee or chestnut-brown with five streaks, one spinal, two dorsolateral and two lateral, and with five broad angular crossbars more or less confluent over the spine; a sixth spot-like bar across the nape, the fore part of the dorso-lateral is pale-buff to bright-yellow. The lower part of the cheek blackish, the basal half of the tail dark ringed.

Length, $7\frac{1}{2}$ inches. Locality, Cape York; collected by Mr. K. Broadbent.

ON A NEW SPECIES OF HOPLOCEPHALUS.

BY

C. W. DE VIS, M.A.

(PLATE XV.)

HOPLOCEPHALUS ORNATUS.

Scale rows, 17; abdominal plates, 132; caudal plates, 25. Head oval, rather large and depressed, distinct from the neck. Vertical shield an elongated hexagon: occipitals large, scarcely diverging posteriorly: prefrontals triangular, with the outer sides rounded; nasal plate very long: postfrontals elongate transversely and turned down to meet the loreal part of the nasal; labials $\frac{6}{6}$, the 4th and 5th upper equally under the orbit. One anterior and two posterior oculars. Temporals $\frac{2}{2}$, the upper anterior one touching the lower postocular and the 5th labial.

Colour, yellow; upper surface of head brown with a yellow spot between the occipitals; labials with the sutures broadly edged with brown; on the upper half of the trunk about 50 distinct crossbands rather narrower than their interspaces and with irregular edges; below the crossbands alternating angular blotches. Beneath bright-yellow, immaculate.

Locality, near Surat. Collected by Mr. F. A. Blackman.

NOTES.

SESBANIA—A NATIVE FIBRE-PRODUCER.—There are thousands of acres of this plant in Queensland; and its fibre might be obtained of any length up to ten feet. By immersion in water for a few days the stems are readily peeled; by rubbing the fibre, as in washing, the cuticle becomes detached, and the result the specimen * now forwarded. It is remarkably strong, and I think, will in that respect, compare favourably with either Manilla or New Zealand fibre. The fruit when green is edible, and the seeds when dried might be used for many purposes. In insolating the fibre the only implements necessary would be a tomahawk, and a wooden mallet to bruise the stems either before or after their being placed in the water—but before would be better, as the water would more readily penetrate between the skin and the wood. Here is an industry to be developed, no cultivation required, no expensive machinery, merely labor of the lightest kind to render the fibre marketable. I believe the collection of this fibre would be highly remunerative to those engaged in collecting it.—C. W. DE BURGH BIRCH.

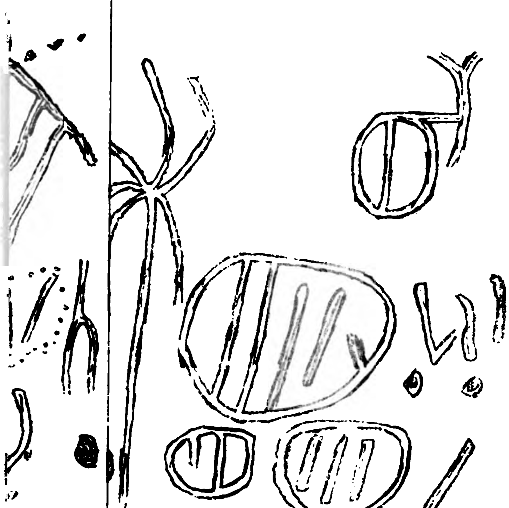
[* The specimen of fibre alluded to was pronounced to be of good quality and, on the evidence of flower and foliage accompanying it, to be derived from one of the varieties of *S. aculeata*, Pers., a common plant in the Brisbane and other districts. It was elicited, in discussion, that this Sesbania had long been recognised as a source for marketable fibre, on which account it had been rather extensively cultivated in India. On Dr. W. Roxburgh's authority (cf, Royle's "Fibrous Plants of India") it was stated that, in the market where it commanded a price of £40 per ton, this fibre bore a good character, on account of its durability when exposed to the action of water. Baron Mueller ("Select Plants," s. v. *Sesbania*) was also quoted in corroboration of the views of these and other previous writers on the subject.—H. T.]

PERAMELES BOUGAINVILLII, Q. & G. — A small bandicoot closely allied to if not identical with that described by Messrs. Quoy and Gaimard under this title has been received from Cape York. So far as can be concluded from the very brief description given by Mr. Waterhouse, the Cape York animal agrees in every essential point with those received by the French naturalists from Shark's Bay, West Australia, and if the two be really the same, the species has a pretty wide range. The noteworthy point is that one of the specimens is an adult female 6.8 inches in length, with two

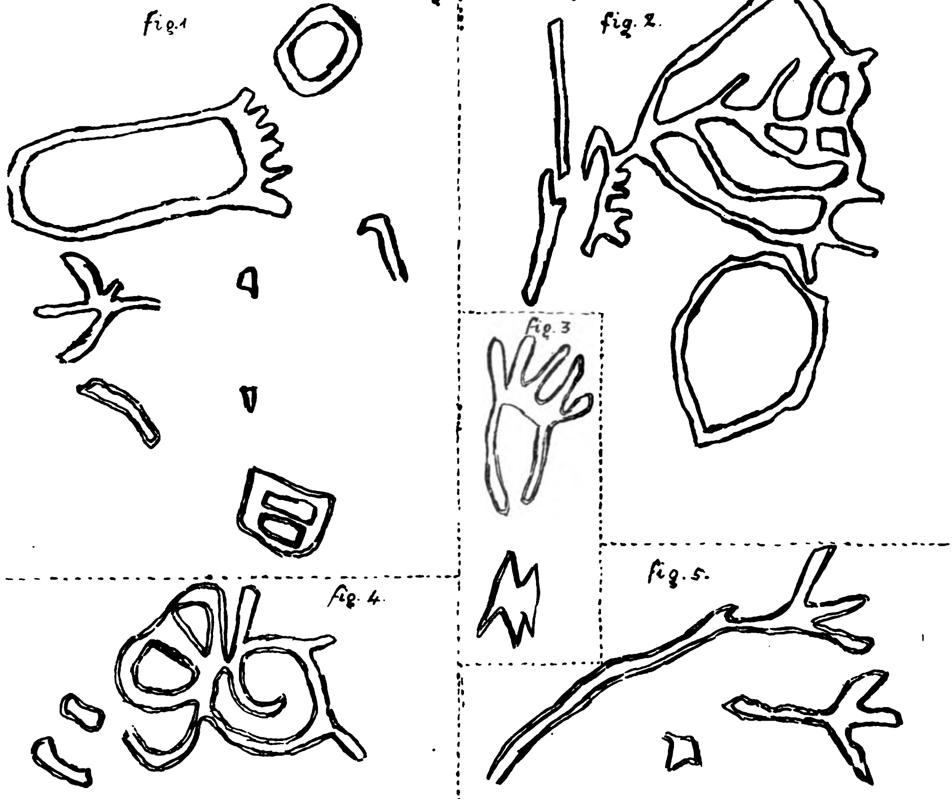
young ones in the pouch, whence it appears that Quoy and Gaimard's suspicions, that their specimens were the young of a species, were as Mr. Waterhouse opined incorrect.—C. W. De Vis.

"Fasciation" in Sicyos angulata, Linn. — The present example of this species of Vegetable Teratology, for which I am indebted to Mr. T. Steel, of Condong Mill, Tweed River, belongs to a Cucurbitaceous plant, *Sicyos angulata*, Linn., so far as can be determined in the absence of flower or fruit. The specimen is about two feet in length, with a breadth of from three to over four inches, and leafy throughout, but without flowers. Fasciated stems similar to the one shown are by no means uncommon occurrences in Australian vegetation, but one seldom meets with so broad a growth on so slender a plant as the present, in which, though often climbing over trees on the borders of our scrubs to the height of 30 or more feet, the normal size of stem seldom exceeds $\frac{1}{4}$ to $\frac{1}{2}$ in. in diameter. The plant to which this monstrosity is supposed to belong has a wide range in Australia, Tropical, and North America, and is also met with in New Zealand, and the Islands of the Pacific. It may be here observed that while in the present instance, the beauty of the plant is by no means entranced by the distortion, the same "fasciation" in the case of the Cockscomb (Celosia cristata) forms its principal attraction.—F. M. Bailey, F.L.S.

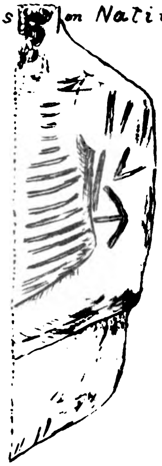
5



Rock Engravings.



Figures on Native.



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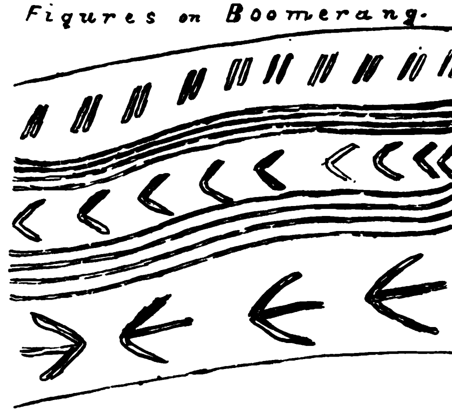


N.T. delt


fig. 1

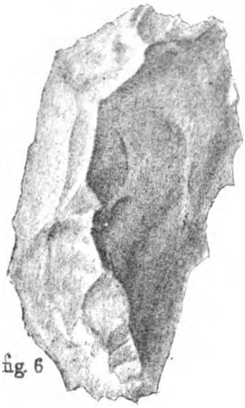


fig. 6

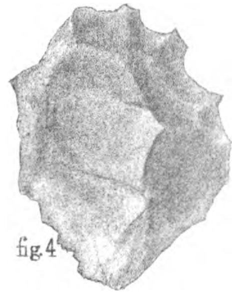


fig. 4

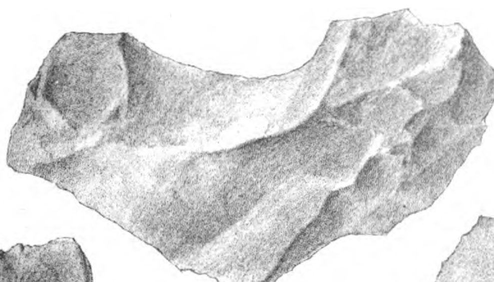


fig. 7

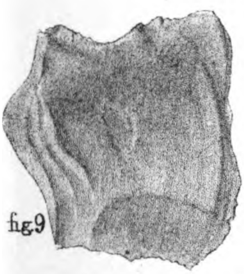


fig. 9

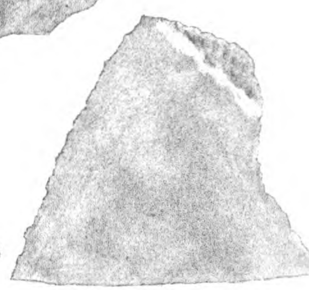


fig. 8


fig. 5

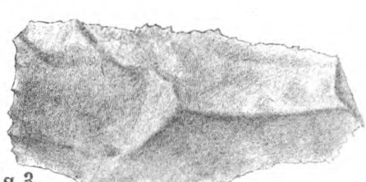
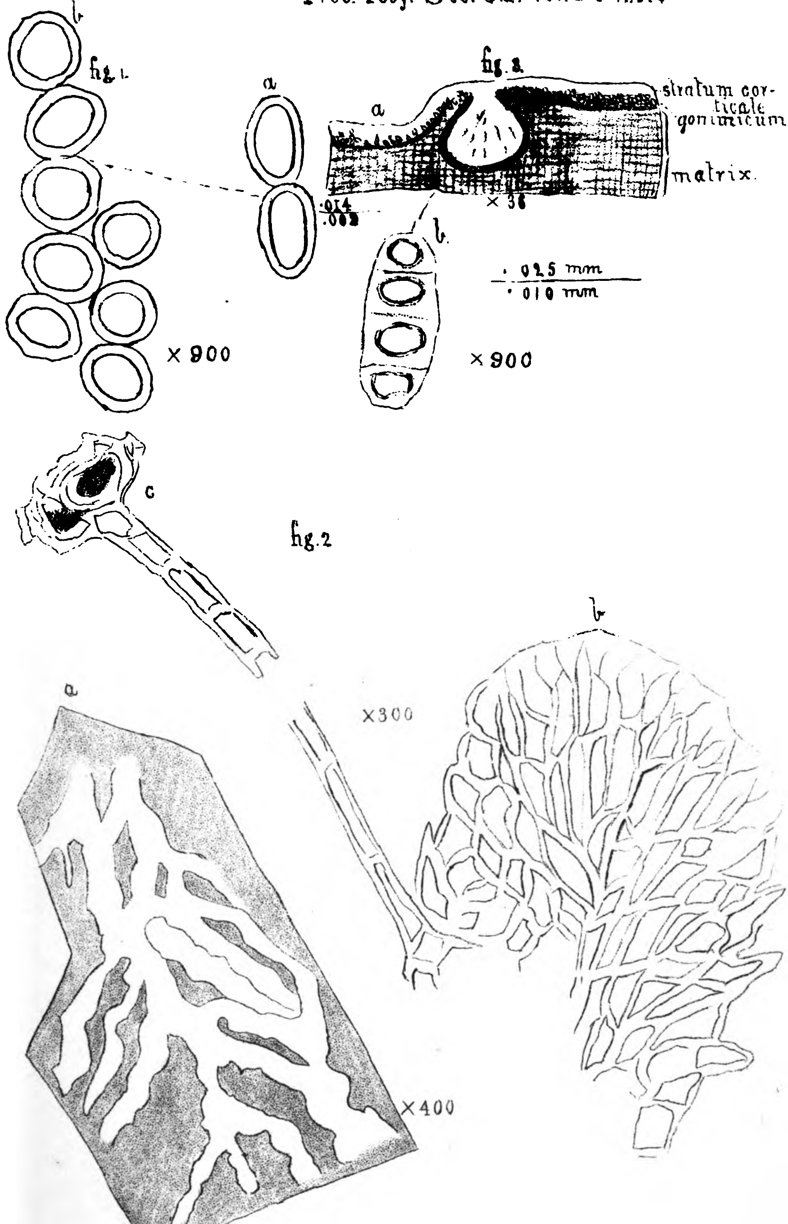


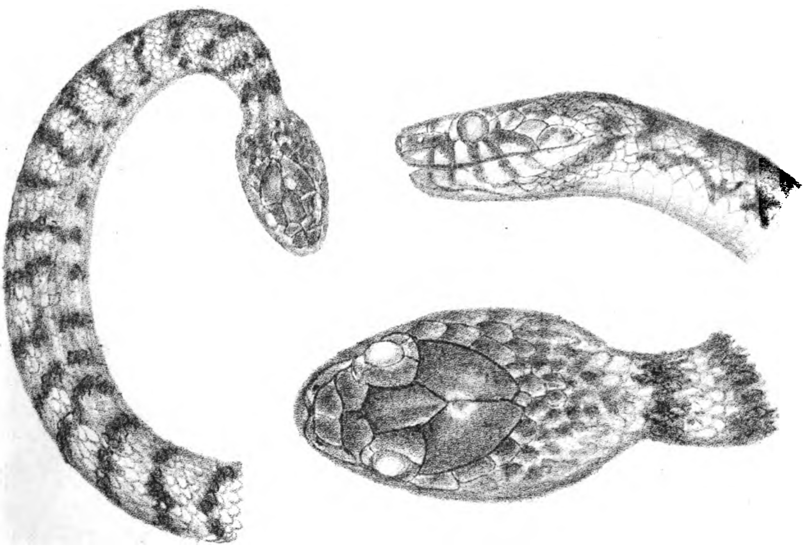
fig. 3

J. O'Connor delt.



Lichenes
fig. 1. Pannaria sorediata, Knight
" 2. Striquia nemathora (Fée) Mont.
" 3 Verrucaria (Porina) Baileyi, Knight.

C. Knight, Well.:- N. Z. Del.



Hoplocephalus ornatus, De Vis.

J. C. Connor del.

CONTENTS OF VOL. I. PART II.

THE

PROCEEDINGS

OF THE

ROYAL SOCIETY

OF

QUEENSLAND.

1884.

VOL. I. PART III.

Brisbane:
PRINTED AND PUBLISHED FOR THE SOCIETY
BY
WARWICK & SAPSFORD,
EAGLE STREET.
1884.

Royal Society of Queensland.

The monthly meeting of the Society was held on Friday, 15th May, 1884. The President J. Bancroft, Esq., M. D., in the chair.

William Kew, Esq., Brisbane, was elected a member of the Society.

The following donations were announced:—

1. "Annual Report of the Department of Mines, New South Wales, for 1883. Sydney, 1884. From Mr. L. A. Bernays, F.L.S.

2. "Papers and Proceedings of the Royal Society of Tasmania," for 1883. Hobarton, 1884. From the Society.

3. "Eighteenth Report of the Acclimatization Society." Brisbane, 1884. From the Society.

4. "Transactions and Proceedings of the Royal Society of Victoria," Vol. XX. Melbourne, 1884. From the Society.

5. "The Victorian Naturalist," Vol. I., Nos. 1—6. Melbourne, 1884. From the Field Naturalists' Club of Victoria.

6. "Results of Rain and River Observations made in New South Wales, during 1883," by H. C. Russell, B.A., F.R.A.S., etc., Sydney, 1884. From the Author.

7. "New Double Stars," by H. C. Russell, B.A., F.R.A.S., etc. *Proceedings Royal Society, N.S.W., 5th Sept.*, 1883. From the Author.

8. "Physical Geography and Climate of New South Wales," by H. C. Russell, B.A., F.R.A.S., etc. Sydney 1884. From the Author.

The following Papers were read:—

FOOD OF THE ABORIGINES OF CENTRAL AUSTRALIA.

BY

J. BANCROFT, Esq., M.D.

(Read on the 18th August, 1884).

Five small packets were forwarded from Mr. W. A. Dare, of Kalamurina, Warburton River, South Australia, to the Editor of the Sydney *Town and Country Journal*, who has submitted them to me.

No. 1. Packet of Pituri.—The usual form of the dried, bruised leaves of the Pituri-tree. It contains no seeds. No live plant of this interesting narcotic is yet to be found in any of the public or private gardens of Australia. I have several times received seeds from Mr. Barrington, and entrusted them to experienced gardeners, but the seedlings damp off in a most vexatious manner.

No. 2. Packet of Nardoo Fruits.—Oval, dark-brown capsules of Marsilea Drummondii A.Br. The Nardoo is a flowerless plant, related to ferns, growing in swamps, looking like a shamrock with four leaves; at times floating on the top of water, but erect as the swamps become dry.

The capsules grow on the creeping stems of the plant, and, when broken, are found to contain yellow egg-shaped spores. These spores contain much starch.

The bruised capsules, when boiled, become a dark porridge, without offensive smell or taste.

The greatest difficulty in preparing this food would be the breaking of the capsules, which are very hard. The aborigines bruise them between stones, and remove the black husks from the yellow, powdery, starchy spores. It is said that the Nardoo may be swept up in plenty from the dried swamps. There is an interesting account of Nardoo in Brough Smyth's excellent work on the aborigines. Mr. Samuel Gayson, of Cooper's Creek, gives the name as "Ardoo."

Though Nardoo is pronounced by Baron von Müller to be a "miserable article of food," the great value of it to starving travellers should not be lost sight of.

No. 3. KOOTOO, GRASS-SEED.—Species undetermined. Each seed is oval, smooth, and shining, one-tenth of an inch long. On the convex side are five longitudinal white lines; on the flatter side two broader white lines, and two white lines are seen on the edges.

Starch of small size constitutes the bulk of this grain, making it a fairly good food.

Mr. Gayson, in Brough Smyth's book, mentions "'Wodlaooroo,' very fine seed taken from the silver-grass growing in the creeks."

Mr. Edward Palmer, in a paper on "Plants used by the natives for food," read before the Royal Society of N.S.W. in 1883, has the following:—"*Panicum decompositum, R.Br.*; native name on Cloncurry, 'Tindil.' The 'Umbrella' grass grows on all western country, with a fine, branching seed-head and broad leaves. about two feet high. Found on Cloncurry plains. The seed-top breaks off when dry, and is driven by wind across the plains. Has a fine yellow seed, like lucerne-seed, which is gathered when the seed is just opened from the sheath."

"It is winnowed and ground between two stones, mixed with water into a kind of paste or thick gruel, and poured into the hot ashes, making it into a sort of damp bread; very nourishing and satisfying."

The seeds of grasses must be very valuable articles of food, particularly those that require little or no preparation to remove their husks.

Of this kind are the seeds of the various species of Sporobolus, on the close spikes of which the shining minute grains may be easily observed, "cast out" of their chaff naturally. In 1881, the late Mr. Ridler sent me a large packet of these seeds, used by the Burnett blacks.

The Burnett settlers call it "Wire-grass," and the aborigines say the eating of it makes them "warry." In their estimation, it is an aphrodisiac.

The wild rice of the Carpentaria swamps *(Oryza sativa Linn)*, however, needs to be carefully cleaned from its spiny chaff, which may be done by rubbing in wooden troughs. This must be the most important grass-food in Australia, being little inferior to cultivated rice. The plant grows six feet high, and produces a good crop even in the latitude of Brisbane. The

has proceeded from behind forwards, and from below upwards; the longitudinal stripes, if any remain, being observable on the fore part of the back, or on the lower part of the body. There is no difficulty in understanding the formation of transverse from longitudinal streaks through the intermediation of spots: we see the process almost in its course in reptiles and fish: in scaly-fish, indeed, it is sometimes difficult to say whether the disposition of the spots should be called longitudinal or transverse—they are equally the remnants of the one and the rudiments of the other pattern; nor can a valid objection be taken to the conclusion that the longitudinal striping rather than the transverse was the original pattern, or at least had precedence in time. The passage from former to the latter is frequently shown by the same individual during its stages of growth; changes in the converse direction never. Further, it is worthy of notice that regular longitudinal striping, in the mature animal, is characteristic of the cold-blooded classes; it is rarely shown by birds and mammals. The truth of the second proposition has long been recognised by ornithologists. The third—that modifications of the type pattern have proceeded by a kind of undulatory movement from the hinder and lower towards the fore and upper parts of the body—will probably require fuller consideration; but, on turning to our Australian marsupials, we certainly find in them something very like a confirmation of it. In the largest of the existing members of the carnivorous division, the Thylacine, male and female, the hinder part of the back is ornamented with a series of conspicuous transverse stripes. These stripes—or, rather, the pale intervals between them—re-appear in the Bandicoots *(P. fasciata* and *myosuros)*, and, after another long suppression, they are reproduced in the *Macropidæ—e.g.*, *Lagorchestes fasciata* and *Halmaturus Irma* —as continuous bands; and in several of the Wallabies as a haunch stripe, representing the interval between the two dark stripes upon the haunch of the Thylacine. Together with these posterior cross-bands, the majority of the Wallabies, in common with the Flying Phalangers, retain a longitudinal stripe on the fore part of the back, and, the Wallabies at least, similarly disposed stripes on the face. Besides these, however, the Wallabies tend strongly to reproduce a second longitudinal band, apparent in *Onychogalea frœnata* and *lunata* as a shoulder-stripe, rendered more distinct by a darkening of the ground colour around it. Curiously enough, this dark area behind the shoulder is more permanent than the stripe itself: it appears again and again without a trace of the latter. All these mark-

ings may be, and are, used as specific characters, and we shall find them exemplified in the species which await an introduction to the Society. One consideration remains. The breeders of domestic animals know full well their tendency to re-exhibit ancestral characters, including colouring and arrangement of colours. To them the recurrence of peculiar markings in several strains of blood would point to their origin from a common stock having those or such-like markings; and they would not be slow to express their contempt for the judgment of a gainsayer. But whether they are more rational than their neighbours, who prefer to regard such similitudes as coincidences, or the result of being called into being to perform hypothetically similar functions under similar conditions, I leave you to discuss, and proceed.

It has been well remarked that the Cape York Peninsula appears to have a fauna peculiarly its own, and experience tends to confirm the idea. Many a harvest has been gathered there; yet, gleanings, sufficient to reward the seeker, still remain on the ground. It is, indeed, more than possible that, when investigation of the interior of the Peninsula becomes safer, a wealth of unknown life will be brought to light. We have a hint of this in the discovery of a fine wallaby, whose haunt of open forest is, as yet, shared by aboriginal man. It is the most conspicuous of the novelties procured by Mr. K. Broadbent during his late sojourn at Cape York, where, by the kind protection of Mr. F. Jardine, he was enabled to penetrate about thirty miles inland from Somerset. We describe it under the name of

HALMATURUS JARDINII, (n.s.)

Size, large; habit, elongate; head with a convex profile, and comparatively short, pointed ears; tail, long and thick; general colour, russet-grey on the upper parts, grey and dirty-white on the lower; a distinct streak across the thigh; a large, reddish-brown patch behind the shoulder; a dark streak from near the eye towards the snout, with a pale one below it, both ill-defined; ears externally edged and tipped with black, internally whitish, with a narrow black edge at the tip; hands dusky, becoming nearly black on the fingers; feet, blackish above, towards the toes, and on the middle of the great toe; tail, black on the upper surface near the end, and with a short, black tuft at the tip; fur of the lower parts, long and soft, yellowish white on the belly, becoming lighter towards the chest, still lighter on the throat.

	Inches.		Inches.
Length of body... ...	24	Of ear...	1-10 lines.
Of tail	14	Of head to the ear ...	3¾
Of tarsus	5		

I find great difficulty in believing that this, the common padymelon of the Moreton Bay and Darling Downs districts, has remained unnoticed until now. No English description of it exists, but it is possible that a German periodical, not in the Museum library, may contain one. If so, the price paid by the colonial student for an accessible description will be the encumbrance of one more synonym in our lists; if not, the name proposed *(temporalis)* may be thought suitable. The nearest allies of the species seem to be *Wilcoxi*, McCoy and *apicalis*, Gld. The upper surface of the head is light rufous-brown, becoming greyish-brown anteriorly, and light-brown round the muzzle. The side of the head to the upper lip is rufous, much brighter round the base of the ears, and on the upper part of the base of the ears externally there is a large spot of rich rufous; a clear white facial streak, beginning indistinctly beneath the eye, borders the upper lip, and is defined below by a rufous-grey continuation from the grey of the neck. The hairs of the base of the ears externally are long and pale buff, contrasting with the rich rufous around; towards the tip they are also long, but more scanty. The apical two-thirds of the ears externally is a rich brown; the occiput dark-brown, without any rufous tinge. The spot on the chin is dark-brown. The anterior part of the back, top and sides of the neck, and part of the shoulders dark-grey, pencilled with white, becoming lighter grey on the fore part of the shoulder; yellow, pencilled with brown, on the arm, and pure brown on the hands. The back is grizzled rufous-grey, regularly pencilled with black; the black is lost upon the flanks and part of the thighs; the grizzling also on the hind part of the thighs and round the root of the tail, which are smoky-brown. The shanks are bright rust, darker than the temples, but less rich than the back of the ears. The somewhat obscure femoral streak is long, running from below the knee well upon the haunch. Hind feet yellowish, much pencilled with black. The base of the tail, beyond the smoky-brown root, is dark-grey, like the shoulders; this colour is continued nearly to the tip, but is pencilled with white in the middle. The tail beneath is yellowish-white, purer white at the base; all beneath nearly pure white. The tail is well clothed above and below, but on the middle of the sides the scales are nearly uncovered.

DENDROBIUM CINCINNATUM, *Sp. Nov.*

BY

BARON FERDINAND VON MUELLER, K C.M.G., F.R.S., &c.,

GOVERNMENT BOTANIST OF VICTORIA.

Stem elongated, slender, with numerous transverse scars, gradually thickened towards the base; leaves alternate towards the summit of the stem, linear or narrow lanceolar, rather chartaceous than coriaceous, faintly and obliquely excised at the summit; racemes lateral and between the leaves, about as long as these, bearing about five flowers; bracts much shorter than the pedicels; lobes of the calyx glabrous, almost membranous, cream-colored, the upper lobe ovate-lanceolate, revolute, the *lower lobes falcate semi-lanceolate, spirally curled back*, twice as long as the oblique-semiovate basal prolongation; *inner lobes (petals) linear-lanceolate, also spirally twisted*, much narrower and somewhat shorter than the outer lobes; tube of the calyx several times shorter than the lobes; labial lobe (labellum) glabrous, considerably extended beyond the other calyx lobes, almost membranous, its *terminal lobule comparatively large, renate, pale-yellowish*, strongly bent back at its apiculated upper portion, traversed towards the base by seven flabellar spreading faintly papillular elevations; the lateral lobules very small purple veined, decurrent on the downward slightly dilated basal portion, the axis lined by three narrow prominent sharp ridges; gynostemium almost truncated.

South Eastern New Guinea.

Cultivated in the Garden of the Acclimatisation Society, of Brisbane, and referred to me by F. M. Bailey, F.L.S., Government Botanist of Queensland. The specimen seen about 2 feet high; the thickened lower portion of the stem to $\frac{1}{2}$ an inch wide, the upper portion of the stem very much thinner. Leaves $2\frac{1}{2}$-5 inches long, from hardly $\frac{1}{2}$ to nearly 1 inch broad. Flowers inodorous. Bracts 1-$1\frac{1}{2}$ line long. Upper lobe of the calyx measuring $\frac{1}{3}$ inch in length, lower lobes slightly longer; the terminal lobule of the labellum nearly half an inch broad. Pollinia 4, connate into two oblique ovate masses, dark-yellow.

This species might with equal right be inserted either in the section Stachyobium or Eudendrobium. Among congeners it could systematically best be placed near D. Johannis.

A DESCRIPTION OF A NEW SPECIES OF PARMELIA FROM VICTORIA.

BY

CHARLES KNIGHT, F.R.C.S.,F.L.S., WELLINGTON, NEW ZEALAND.

(Communicated by F. M. BAILEY, F.L.S.)

(Read on the 8th August, 1884).

(PLATE XVI. FIG. I.)

THE following is a diagnosis of a new and curious Lichen, collected by Miss Campbell on Mount Kosciusco, Victoria :—

Parmelia Campbellii, C. Knight (Sp. Nov.) *Thallus sordide cinereus rigidus laciniatus everniæformis subtus niger nudus laciniis linearibus convexis, convexis creberrime rugoso—granulatis (granulis in centro punctatis) marginibus non atris. Apothecia maxima (latit demum circa 13 m.m.) ventricoso—cyatho foria dilata badio—rufescentia, receptaculo lacuno—rugoso, basi podicellato, paraphysibus articulatis crassiusculis adglutinatis. Sporæ in ascis saccatis parvæ simplices rotundæ vel subovatæ incolores, latit. 0.005 m m.*

Legit Flora M. Campbell, Mount Kosciusco, Victoria. F. M. Bailey, communicavit.

Allied to Parmelia physodes *var. mundata Nyl.*

EXPLANATION OF PLATE XVI.

Fig. 1, section of minute portion of *apothecium.*
- *(a) hymenium.*
- *(b) hypothecium.*
- *(c) gonidial layer.*
- *(d) medullary layer.*
- *(e) gonidial layer (cortex).*

NOTES ON THE INHABITANTS OF NEW IRELAND AND ITS ARCHIPELAGO, THEIR FINE AND INDUSTRIAL ARTS, CUSTOMS AND LANGUAGE.

BY

A. J. DUFFIELD.

(*Read on the 8th August*, 1884).

PLATE XVII.

MY interest in ethnological studies began a quarter of a century ago in New Zealand, when I saw, for the first time, human faces engraved with taste and skill, and in the most elaborate way. From New Zealand I went direct to that part of the Andes which lies under the tropic of Capricorn, and, in the ancient city of Chuquisaca, a thousand miles from the Pacific, I encountered, among the cross-breeds of the "Indians" of Cochabamba, precisely the same printings on the skin of the women as I had seen in Dunedin; and now, only the other day, when I visited New Ireland, I found there, among women of fair skin, the same "tattauing"—to use their own word—on their faces as I saw in Blueskin Bay and Chuquisaca. I turn to some old notes, taken in Egypt a few years ago, and find that, in Cairo, people of the lower class still tattoo their faces after the same manner as certain human figures are tattooed on Egyptian monuments. One of many figures introduced among these cuttings of the flesh is a cross—the very same cross which is carried at this day on the breasts of New Ireland women, and is identical with the cross found in the Temple of the Sun in Cuzco 360 years ago. These cuttings are all of blue colour. I also find in the Book of Leviticus, xix., 28, the following prohibitory law:—"Ye shall not make any cuttings in your flesh. . . .nor print any mark upon you." It will, also, be remembered that that woman, Jezebel, was accustomed to "paint" her face; and, if we may trust the prophet Jeremiah, iv., 30, Israelitish maidens had, in his time, lapsed into ancient vice, and rent their faces with "painting." Now, this word "painting" is really nothing more than what is technically known among book-binders as "blind tooling," and is the same

as was practised in Thebes 5000 years ago, more or less; in Cairo in 1880; New Zealand in 1860, and in New Ireland, the Solomons, and Polynesia in the present year of grace. The examples of this "painting" which I have copied from New Ireland women will, I trust, be acceptable to Ethnologists and all who take delight in ethnic studies.

Of the language of New Ireland and its adjacent islands, I found that, while the words were the same among half-a-dozen different tribes and islands, the pronunciation was so different as to make it appear, at first, that they spoke a different tongue, but, in reality, I think the languages of the archipelago are all of one family. It is true that I met with more Spanish words in one island than in another, and the same may be said of Arabic words. Of these latter, I point out four or five remarkable examples. *Baramikeh* was the name of a family famous for the favours conferred on its female members by Haroon Er-Rasheed. The term is now applied to a class of women who are, at the same time, the handsomest and most abandoned of the beauties of modern Egypt; also of the same class, when time has battered their charms, and who then obtain a precarious living by fortune-telling, "puncturing and circumcising," and the same word is used to-day as a term of endearment among the female natives of New Ireland. The ancient word *halfa* is also in use among the people of Lower Egypt, and *alfa* is the word used among the "Indians" of the Peruvian valleys to denote the same alfalfa, or lucerne, common to both countries. *Kizmett* signifies, in New Ireland, the unswerving course of the sun. *Fono* is an ancient Egyptian word for the bracelet holding a charm; *fuano*, in New Ireland, is the ring which is hung from the septum of the nose, and *saab*, in New Ireland, is used in the same sense as *sahib*. The pottery of New Ireland is Egyptian in form and ornamentation; so are their reed musical instruments: *gott*, the pan-pipe; *tiffenow* (to sing), a flageolette; and *knapp*, a Jews-harp, exquisitely made of bamboo. I heard no tune played on these instruments, but the notes, although produced at random, made a pleasing noise. I found no metals or ores of metals, except an oxide of maganese, which they call *labán*, and men only use it to blacken their skins. They are fond of painting their faces, and some of the designs and disfigurements would create a sensation in a travelling circus at home if the clown and slippered pantaloon were to adopt them. Their personal adornments were, for the most part, made of shell-work; the *peil*, a circular plate ground out of the *Tridacna gigas* shell (always worn by men on the chest), and a crescent

on the forehead were certainly most striking, both in effect and for their workmanship. Ear and nose ornaments were abundant, and elaborately cut. Flowers and sweet-smelling grasses were plentifully used by the women; sometimes, when thrown away after use, they would be worn by the men in their armlets. The fine, hand-made shell-beads, chiefly worn by women, are marvels of patience and skill. The forms into which they were strung are all Egyptian forms; so are their combs, Korro. Bracelets, common to men and women, made from *Trochus niloticus* shell, are very striking in effect and workmanship. Weaving, spinning, and colouring of flax to make armlets and garters—not to hold up stockings, but to adorn the leg immediately below the knee, worn like our "garter" order—are beautiful examples of artistic taste. But their skill and devotion are lavished on their spears. They have no bows and arrows, but their spears and clubs—especially the *ampacalufatt* and *kelsucool*—are shaped and decorated with surprising love and taste for all that is graceful and beautiful. This is not to be wondered at, seeing that blood-revenge is the only religion which is universal, and passionately followed, among them. The idea that English men-of-war, by burning canoes and villages, as punishment for the murder of white men by natives who had been outraged, in the hope that such practise will cease, is erroneous. Ever since the cruise of the "Rosario," ten or twelve years ago, the ornamentation of arrows, clubs, and other lethal instruments has gone on improving—a statement easily verified by comparisons made at the islands of the old weapons and weapons at present in use. The sword of Boabdil, the last of the Moors, still to be seen in Granada, is not more lavishly ornamented, nor with greater taste than are some of the spears of the New Irelanders and their neighbours. The principal agricultural implement which I was able to secure is the *fah*, a kind of hoe, made of shells, whale's teeth, stone, and now always of iron. The form of this implement is also Egyptian, and is the same, only smaller, as used in New Guinea and Fiji a century ago. They cultivate on a great scale the cocoa-palm, taro, and fine yams, their chief staples of food and trade; also sugar-cane, tobacco, arrowroot, bread-fruit, several kinds of melons, vegetable-marrows, sweet potatoes, and many other vegetables, nuts, fungi, and fruits. I found them a singularly polite and courteous people, strikingly Oriental in their conversational habits and customs, and Spanish, or Moorish, in many homely gestures and facial expressions. I did not notice a single case of mutilation; all their teeth and eyebrows were

intact. Betel-nut chewing was very general, and among the people of Toolatt, or Fisher Island, it appeared to be indulged in to a demoralising excess. The only displeasing things to be seen among them, in matters of taste, are the flexible, white rings worn in the septa of the noses, and the discolourisation of the pretty teeth of the women by the use of the betel-nut. The men go absolutely nude, and the women also, with the exception of a slight vegetable apron worn by the latter, and there can be no doubt that the men, in outward seeming, are, according to an Englishman's cultivated notions, more modest than their wives and daughters. In physique they are generally feeble, of slight build, and light weight; one of the biggest of their men, 5 feet 10 in height, only measured 29 inches round the chest. They eat fish, poultry, pigs, and opossums. They are very timid in the water when a few miles from shore; I have seen men cry aloud for help, trembling with fear, if their canoe capsized—no doubt owing to the abundance and voracity of sharks. Their canoes are frail things, but the *ammón*, or figure-head (also Egyptian) is a striking work of art. They use no sails. Their paddles are well shaped and ornamented with fishes and human faces, well carved.

Of the migrations, immigrations, and co-migrations of these races in old times; of the peopling of America from Egypt and India through Polynesia, and the last migrations from America three hundred and twenty years ago to Torres Straits, Papua, New Ireland, and Guadalcanal, I hope to address the Royal Society of Queensland on another occasion.

Explanations of Plate XVII.

No. 1. The cross on female breasts.
2. Female tattooing.
3. Female navel ornament, cicatrisation.
4. Female tattooing.
5. Female cicatrisation.
6. Female tattooing.
7. Male and female cicatrisation. Only the buttocks of women are cicatrised.
8. Female cicatrisations.
9. Ibid, ibid.

Note.—The lips in the drawings on the stone are too much negroised. Neither the New Irelanders nor the inhabitants of the Archipelago are negroes, although an occasional negro strain is met with, but it is seldom seen in the lips.

WORDS, PHRASES, Etc., DERIVED FROM NEW IRELAND NATIVES.

I used the Greek Alphabet in taking down the following words, phrases, numerals and proper names, and found it the only reliable way of fixing sounds with rapidity and exactness. I was always careful not to repeat a word on hearing it for the first time, for the reason that my word would be invariably repeated back to me as the native word. All the names of men and women are either names of fruits and flowers, or infirmities, and natural deformities, and are as picturesque, gross, and quaint, as their own pet names among the coal miners, and pit women, of North Staffordshire, where we find such delicacies as "Yaller-balley," "Spindle-shanks," "Hogswill," "Dogs-nose," "Cats-mug," "Cock-eye," and "Drink-dregs." It would be impossible to translate the meanings of all the names, but I give them for the use of students in comparitive philology.

Afalángue: Applied to the writer.
Afeméss: To cough.
Afoot: A large, red bean, poisonous (Mucuna, s.p).
Akasapp: A river; Altis.
Alkatot: A star.
Allabán: Water-bottle made of cocoa-nut.
Allaméss: A house, also Alsamess.
Amanoon, Amanoonmet: Cold; it is cold; I am cold.
Ambà: A man's name.
Ambeel te pesette: A large, brown mollusc; good to eat.
Amboll: A proper name.
Amboya: Probably a dance.
Ambuleen: The lips, mouth.
Amboonang: The belly or stomach; "amboonang soch-soch-met," the belly-ache.
Ambutang: The navel.
Ammón: Figure-head of canoe.
Ampakalufatt: A club or baton.
Ampegananeman: The thumb.
Amphór: Man's name.
Ampookaneman or Ambegememan: The elbow.
Anatt: A fruit.
Anamatton or Anematton: The eyes.
Anconcong: The neck.
Anesse: A large, brown, poisonous mullusc (Conus textiliosa).
Angagool: The shell (Margaritifera) from which the "pearl-plates" are cut.
Ankeká: A beautiful-plumed parrot.

Anmalmal: Broad, ornamented garter worn below left knee. Mahmal is the Egyptian ark in which are carried on festival days two copies of the Qur'an.
Anmar: Penguin.
Ansanétago: A paddle.
Ansinaff: A broom or besom.
Anteet: Pitch for joints of canoes.
Antekron: To evacuate, feculence.
Antoltoll: Butterfly.
Antùlal: A reed-pipe of three notes, 1 foot long, ½ inch in diameter, with an open mouth-slit at one end, which is pressed against the tightly-compressed lips, and a small hole near the other end. It is made of cane.
Anwal: A rope; Awal and Nwal.
Appatak: Very cold, shivering.
Apukantabay: Knee-cap.
Arrefague: Needle.
Asameenlo or Asamelo: Sweet lemon. (Spanish, Azamboa, the citron).
Atalangasum: Moustach.
Balamikeh, vid: Baramikeh.
Balankeken: Sole of the foot.
Balanemán: Palm of the hand.
Balansees: Sprig of "Chili pepper" plant.
Balasees or Balasese: "Chili pepper."
Balleyoch: Woman's name.
Bambaloon: Ear-ring.
Bambees: A bracelet for holding.
Baul: Man's name, pronounced Baool. Spanish, trunk.
Baramikeh or Balamikeh: A term of endearment; also lasciviousness.
Basanee: A basket. In American Spanish, pôt de chambre.
Batt: Thunder-cloud, coming rain, water-spout.
Batteau: Ship.
Batt-balloo: Thunder.
Batt-kause: Dark rain-cloud.
Beeloch: Man's name.
Bermoot: Man's name.
Bid-bid-anéman: The fingers.
Bid-bid-nakikén: The toes.
Bidlick: Squall, wind and rain.
Boch: A small pig.
Boorépèatégow: A blow on the mouth given by husband to wife.

Bootey: Man's name.
Bun-bun: Female genitals.
Cabell: Coral lime.
Cabiney: Man's name.
Cabón or Kabon: A necklace of fine shell beads; also money.
Cansmet or Canseek: My purple, woolen waistcoat.
Caucán: Sweet potatoes.
Cocogibbie: The fish Periophthalmus, Sp.
Cocorot: A Cock.
Combong: Man's name.
Comfetùs: The Vagina.
Comoch: Banana.
Conquem: Cocoa-nut.
Con-que-que: A dried fungus (*Hirneola*, sp.); a delicacy.
Cortakenque: I have cut my . . . . . .
Dan: A bottle.
Dan-amandara: A quart-bottle of white glass.
Danikiken: The leg.
Dochbow: A man's name.
Ea: All right.
Eeelé: Imperative of to look, see. Vid Mèlé. (c Spanish Ela—there she is; behold her, Aylah!)
E soch: To burn or be burnt.
Eeyou: A spear.
Es-saleeb or Es-saleep: On the wood or on wood.
Etekte, negation: There is nothing.
Eu, Eyó, Eyo, Yeo or Hu: An affirmative with all the shades given to our yes—viz., the soft, hesitating Eu, the emphatic Eyó, the doubtful Hu. Vid. Ea, all right.
Eyüs or Eus: Rain.
Faagey: The finger nails.
Fah: A native hoe.
Fakowmeleh: Woman's name.
Fampou: A favorite woman's name; also a long, purple, delicious fruit.
Fantaté: Advance.
Feenamon: A woman's name.
Femsua: Used after sneezing. Vid. Vivémsü.
Fet: Four. No. 4.
Festelley: Man's name.
Fifine or Feefeen: A woman (married?). Phr.: Fifine Miau, a woman of Miau.
Finao, Finau or Finow: A rope.
Fingatee: Man's name.

Fiss, Una-fiss-namón: Paddle of a canoe.
Footpueg: Woman's name.
Fuanow or Fwanow: Beads; also ring suspended from septum of the nose.
Fün-fün: The "fig-leaf."
Galong: * ahoose. Lightning, shock of earthquake.
Gooey: Man's name.
Gogorong: The nose.
Gott: Pandean-pipes.
Gott-keef: Imperative of to play *Gott*, and spoken with haste.
Honeel: Fishing-line.
Huam sagker: An epithet of various meanings.
Huana (not aspirated): What are you doing? or What do you mean?
Huanoo: an arrow.
Igless or Ingless: White men.
Ilambón: Woman's name.
Imbór: Man's name.
Imbutall: Woman's name.
Impeek: Woman's name.
Inmaneel: Woman's name.
Kabón: Six; also small, black-and-white beads made from shell; necklace; generic word for money.
Kafees: Seven. No 7.
Kai-kai (accented on last syllable): Dinner, to eat.
Kalob-nadan: A crab (Oxypode, sp.)
Kakanünquebeck: The bite of a parrot.
Kalut: To fall or slip down.
Kaloot: Firewood.
Kamesen: The beard, the chin.
Kantookeán: A blow on the abdomen.
Kapkap: All gone, finished, no more.
Kaplatt: Man's name.
Kapool: The opossum.
Kasapp: Slowly.
Kasau or Kasao: Fire.
Kassoogue or Kasugey: Imperative, sit down.
Kasüng: The breast.
Kat-kath: A seven-pronged spear for taking fish.
Katau: Short sword.
Kauk (pronounced Kok): Generic word for fish.
Kauk-foon: Turtle.

* The G s are always hard.

Kauk-gelaff: Small fishes swimming about in the sea.
Kauk-lingpäp: A large sea-fish like a dolphin.
Kauk-pommél: A sperm whale.
Kause: Smarting of the mouth, also a man's name.
Kause sen-gue-mem: The rain is coming.
Kavál: Eight. No. 8.
Keef: To play a wind instrument.
Keerikenit: Cicatrisations on the body.
Kekausor Quekaus: To scratch.
Kekengue: Vid. Keken.
Kekén or Kengue: The foot.
Kelargi: To cut the hair.
Kelsukül: A club, in form like a cricket bat.
Kerkeri: A bunch of small, threaded shells, hung a back of neck in the dance.
Kizmet: The sun's course, sun-rise.
Knap or Nap: A "Jews-harp" of bamboo.
Kodong: The Vagina.
Kollót: To fall.
Konemón: The figurehead of a canoe.
Koogue or Koogey: Imperative of to sit down.
Korro: A comb.
Kuss: A man's mame, also a running sore.
Labán: Ore of manganese.
Lagaloo: Man's name
Lakavatt: Man's name.
Lanbeau: The native bee.
Lee: An aromatic bulb, a delicacy.
Liliguy: Woman's name.
Sin-batt: The rainbow.
Lodondoll: Man's name.
Loombéli: Woman's name.
Loosei: Man's name.
Lublup: Man's name.
Lucián: Man's name.
Mague tarrán: Natural history, the Skua.
Malmal or Mahmal: A bracelet differing from Pambess.
Malán: The eyes.
Malawáh: Man's name.
Malen or Mallén: The moon.
Mandowitt: Man's name.
Mangor: Man's name.
Manque: The hand.
Marra-fán: Woman's name.

Marra-marra: A "festered" thumb.
Marrótt na Kayen: Drops of falling water.
Martinbuiyan: Man's name.
Mastey: Man's name.
Matinparao: The Sulu-apron or loin cloth of women.
Meele: Look! see! Eelé.
Melagót: Hold your noise; "shut up."
Metén y soch: Tooth-ache.
Metzeiné kai kai: I have eaten too much.
Meera, Meerah, Meele: Look! see! behold!
Morriloo: Man's name.
Meelbon: Man's name.
Naboon: Enough, no more.
Namboon: Man's name.
Napsee Knapp: A Jews-harp in bamboo.
Nee-nee: The little common black ant.
Neesán: The teeth.
Nefa fouke: To shave the temples.
Némän: The arm.
Non, Nun: No.
Nyan-nyan-nyan-nan: A term of contempt, spoken very rapidly; like our washerwomen say, nag-nag-nag.
Oo: As in too, two; No. 2.
O'caiga: To fall. *Caer*, Spanish.
Olalan: The hair of the head, or Ololó.
Ololokonmock: Woman's private hair.
Ololonmal: Eye-lashes.
Ongoorier, Ungurier: Native name for another island.
Operou or Operow: An indelicate expression, probably a slang word.
Oumet or Oomett: Dead, or to die, or to sleep.
Pafin: An arrow; see also Huanoo.
Pakaloon: The head.
Pakalungue: I have had my hair cut.
Pakaluntalegue: A vegetable, in shape like a skull.
Pakeleepatt: Put your head in the water.
Pambess: A bracelet on the arm for holding a pipe, etc.
Pamgalée: Man's name.
Pampél: Writing or to write, or paper (writing).
Pangalfam: The gum-tree.
Pangalfamgue: The kangaroo.
Pangamgam: A fern used by females for aprons.
Pangoll: A bow; also Kanáyoo.
Pantaffatt: Man and wife.

Pantastaff: Cut figures, an engraving.
Pantastiffniquen: The fibre of the cocoa-nut.
Papá: Man's name.
Paperow-roogee: A raft of bamboo, un caballito. Sp.
Parweenafew: Man's name.
Passéll: Man's name.
Pasuán: The shoulder.
Pawangi or Pewangi: The thigh the leg.
Peil: The large, round shell-plate, with a hole in the centre for suspension on the breast; derived from the *Tridacna* shell by grinding.
Peepeen: Eye-brows.
Peepeerimatangue: Eye-lashes.
Peeseé: The sun, solar heat.
Peseena: The sea in which the sun sets.
Pesina-batt: The rainbow.
Pigawineney: Let go (nautical phr.)
Piglimbeowgen: The hair of the armpit.
Pilpirramatan: The eye-brows.
Pinafoon: Tortoise-shell.
Pin-pin: A bow-string.
Piriunquen: Husk of cocoa-nut.
Poklanemann: The hand.
Pookboolin: The lips.
Porrot: A cock, rooster.
Poss ee Poss: To be scalded, burnt, or scorched.
Potankeken: The foot.
Pseguesügè: Sun-set.
Psookétené: Turn it round.
Pus-püss: A cat, a white shell, also an delicate word.
Pulankakow: The heel.
Pülla-pülla: A boat, one of a ship's boats; perhaps a newly-coined word from "pull away."
The Putaputoon: Buttocks, Spanish, a harlot.
Quaake: To be sick, vomit.
Queká: What is this or that.
Rafafung: To make water.
Rafü: Water.
Rafü na dan: To wash up.
Sá or Thsá: Firewood.
Sá: Be silent.
Saach or Sach: Bad, putrid.
Sabrobó: Good, fine; applied to a cocoa-nut of good flavour. Spanish *Sabrosa*.

Samgass: Name of head man or "king."
Sasán: Man's name.
Seean: Name of a tree; Sian.
Seebükfélao: Paddling around for pleasure.
Seefoo: Solar heat, glare.
Seketefiss: Vid. Fiss.
Senamatán: The forehead.
Sepai: Man's name.
Separee: Fowl.
Setebatteau: A large, red star-fish, 7 inches in diameter.
Siau: Seeaw: Name of a tree.
Simiboch: A bone knife.
Sin-batt: Rainbow.
Sochmon or Sochmann: Cat's cradle.
Soch-soch: General term for pain.
Solyman: Man's name.
Sombell: Man's name.
Sonass: Man's name.
Subatt: Man's name.
Sumbeal: A spear.
Sukasanfül: Ten, No. 10.
Sumel: Man's name.
Sumgool: Man's name.
Susung: A woman's breast; Susungey, my breast.
Swee: An impatient expression "get out of the way."
Taboo: Grain like maize.
Taboorket: Man's name.
Taikah: Man's name.
Tamball: A brass button.
Tamakinarey: Man's name.
Tarbeleck: Man's name.
Taro: The edible Arum (Caladium esculentum), extensively cultivated in these islands, and one of the staple foods.
Tarra: Taro.
Tarrán: A large sea bird.
Taran: Gull, a booby.
Tataan: The cheek.
Tatán: The forehead.
Tattau: Tatoo.
Tchetoy: Man's name.
Teká: One, No. 1.
Tenén: Take this.
Thsá or Sá: Firewood.
Tickteek: A bad smell.

Tiffenow: To sing.
Tinabooklee: Man's name.
Tinafambeese: Man's name.
Tinafasinboon: Man's name.
Tinaguinacoo: Man's name.
Tinamnigh: Woman's name.
Tinamong: Man's name.
Tinampuracoo: Woman's name.
Tinasaboch: Woman's name.
Tinasaby: Woman's name.
Tinkeran; Woman's name.
Tocatung: May I have some or take.
Tomainkelál: Man's name.
Tombar or Tombara: Native name of New Ireland.
Tomess: Man's name.
Tomook or Toomoo: A pumpkin.
Toolatt: Fisher Island.
Tuan: Man's name.
Tül or Tool: Three, No. 3.
Tü-tu; Thee or thou tütü sa bookfiss (take you a paddle row).
Tzigleh: Man's name.
U: Two, number 2; or Oo.
Udom: Lost.
Unlang: A firefly.
Unquén or Oongwén: Husk of cocoa-nut.
Valkasû: Nine, No. 9.
Vevémsu: To sneeze.
Vitellee: Try it.
Yampeloch: Man's name.
Yanombell: Woman's name.
Yapess: Man's name.
Yawootsereney: Woman's name.
Yelli-yelli: Man's name.
Yemseh: Man's name.
Yerremegess: Man's name.
Yerrim: Man's name.

ON NEW SPECIES OF HYLA.

BY

C. W. DE VIS, M.A.

(Read on the 8th August, 1884).

HYLA FENESTRATA. = [illegible]

VOMERINE teeth in two straight series between the choanæ; tongue subcircular, notched on the free hinder edge; head broader than long; snout depressed, sloping anteriorly; nostrils central between the eye and the tip of the snout; the eye two-thirds of the length of the snout, more than its own distance from the nostril, and equal to the interorbit; tympanum two-thirds of the eye; fingers free, narrow, disks very small; toes less than two-thirds webbed, the fourth elongate; inner metatarsal tubercle large, shovel-shaped, outer none; skin smooth, granulate on perineum only, above olive-blue, beneath dirty-yellow; lips pale, minutely marbled with black; flanks white, spotted with black; the front and hind surfaces of the thighs with numerous broad black bars, connected by fine lines across the upper surface; fore and hind surfaces of the shanks and arms with white-edged black triangular spots, similarly connected

Measurements.	Lines.	Measurements.	Lines.
Total length	27	Hind limb	45
Length of head ...	11	Hind foot	19
Breadth	13	Fore limb	17
Length of snout ...	5	Fore hand	7
Interorbit	3		

Locality, Tweed River. Collected by Mr. T. Steel.

HYLA IRRORATA. = Hyla caerulea

Vomerine teeth in two small, rather distant groups behind the choanæ; tongue a broad oval, notched on its free hind edge; head much broader than long; snout truncated; nostrils much nearer to the tip of the snout than to the eye; tympanum two-thirds to three-fourths of the eye; fingers broad, webbed at the base, disks two-fifths of the tympanum; toes two-thirds webbed, the web reaching the disks of the third and fifth and fringing

the fourth, which is short; two metatarsal tubercles, the outer small; skin smooth above, granulated beneath, more coarsely on the abdomen. Lead-blue to olive-brown; beneath rufous or buff —in young examples, paler on the throat and purplish on the under and hinder surfaces of the thighs;—on and behind the angle of the mouth a short line, or series of spots, white; a spot on the arm (nearly constant), and a line along the hinder edge of the fore-arm white; a group of small white spots on the groin, sometimes extending round the coccyx; occasionally a few scattered white dots on the back, and a large one on each side of the throat.

Measurements.	Lines.	Lines.	Measurements.	Lines.	Lines.
Total length ...	32	20	Hind limb ...	42	28
Length of head...	8	6½	Hind foot ...	19	13
Length of snout	4	3	Fore limb ...	17	11
Interorbit ...	9	5¾	Fore foot ...	8	5¾

Locality, Gympie. Collected by Mr. H. F. Wallmann.

HYLA NOBILIS. = Rana [illegible]

Vomerine teeth in two very small groups behind the level of the choanæ; tongue very large, bilobed on the free hind edge; head longer than broad; snout moderately depressed, obtusely pointed, produced; nostrils nearer to the tip of the snout than to the eye; tympanum two-thirds of the eye; fingers free, narrow, disks very small; toes fully webbed, the web reaching the disks of the third and fifth; fourth toe elongate, disks small; inner metatarsal tubercle moderate oval, outer none; skin above rugose, beneath smooth. Reddish-grey above, beneath boldly marbled black and white, in the young especially on the throat and chest, the marbling growing more diffuse with age, and almost lost in large examples; frenal region blackish; side of the body from the tympanum black edged above with a white line, running from the tip of the snout on the edge of the upper eyelid and backwards—in youth, similarly edged below;—lips spotted with white; fore and hind surfaces of limbs mottled with black, upper surface of limbs with a few broad cross-bands.

Measurements.	Lines.	Measurements.	Lines.
Total length	26	Hind limb	44
Length of head ...	10	Hind foot	20½
Breadth	9	Fore limb	15½
Length of snout ...	5	Fore hand	6½
Interorbit	6		

Locality, Cape York. Collected by Mr. K. Broadbent.

HYLA PENINSULÆ.

Vomerine teeth in two groups between the choanæ; tongue ovate, notched on the free hind edge; head considerably longer than broad, pointed; snout sharp, protruding; nostrils central between the tip of the snout and the eye; tympanum two-thirds of the eye; fingers narrow, free or slightly webbed at the base between the fourth and fifth, disks very small; toes fully webbed, the webs reaching the disks of the third and fifth; the fourth toe elongate; inner metatarsal tubercle oval, outer none; skin smooth above, and anteriorly beneath, posteriorly granulate; olive-brown, a pale longitudinal band on each side the back, and the enclosed vertebral-band broken up into dark blotches, more or less confluent; upper lip spotted, or continuously edged with a white line, which margins the lower front part of the orbit and the tympanum, and defines a black spot behind the tympanum; flanks speckled with black; upper part of thigh and tibia blotched and lined with black; beneath pale yellowish, with the chin grey and the thighs rufous (purplish).

Measurements.	Lines.	Measurements.	Lines.
Total length	27	Hind limb	45
Length of head ...	11	Hind foot	19
Breadth	13	Fore limb	17
Length of snout ...	5	Fore hand	7
Interorbit	3		

Locality, Cape York. Collected by Mr. K. Broadbent.

FRIDAY, 12TH SEPTEMBER, 1884.

THE HON. A. C. GREGORY, C.M.G., F.R.G.S., &c., IN THE CHAIR.

The following donations were announced :—

"Proceedings of the Linnean Society of New South Wales," Vol. IX., Part 2, Sydney, 1884. From the Society.

Atti della societa toscana de scienze naturali processi verbali, Vol. IV, 4th May, 1884. From the Society.

"Victorian Naturalist," Vol. I., No. 8, Melbourne, 1884. From the Field Naturalist's Club of Victoria.

The following papers were read :—

QUEENSLAND GOLD DEPOSITS.

BY

JOHN FALCONER,

MINING ENGINEER.

(*Read on the* 12*th September*, 1884.)

Some years ago, in an article written for the "*Queenslander*," on the mineral wealth of the Burnett District, certain statements were made, with regard to the occurrence of free gold in the caps of Copper lodes, as far as these lodes were acted upon by atmospheric influences. What I foretold in the statements I then made has been recently verified at the Cambia and Mount Morgan with satisfactory results.

Deposits containing gold occur in nearly all the copper lodes I have visited in Queensland, and some of the Mount Perry mines would pay well for working, if the natural process, which has been going on for ages, was imitated and assisted; which process, may be briefly described, as the decomposition of gold-bearing pyrites by the action of the atmosphere.

Example I.—Some years ago, a mundic reef was worked on the Burnett Range, between Baramba and Kilkiven, un-

successfully however, although the Sydney Mint assay gave 13 ounces of gold to the ton, beside other metals, silver &c., 16 tons of ore were taken out and 2 tons sent to the Black Snake machine at Kilkiven to be crushed, yielding only 5 dwts. gold; 1 ton 3 cwt. was sent to Gympie and with similar results, the reef and stone were then adandoned. I visited the reef again $4\frac{1}{2}$ years afterwards; meanwhile the stone had disappeared and in its place was a low mound of red ferruginous cement streaked with greenish clay (green earth). This mound was washed up with the result of 11 ounces 7 dwts. of pure gold.

Example II.—A similar case occurred in the Mount Perry district, on some parties washing the mound of iron "cement," which remained on the surface from the 50 or 60 tons of low class copper ore, which had been taken out during the development of the Cambia mine. This led to the mine being satisfactorily worked as a gold reef under the name of the "All Nations." This reef payed so long as decomposed mundic was obtained and ceased to pay as soon as the undecomposed ore was penetrated.

Copper lodes with gold bearing caps occur at Rawbelle, Mount Perry, Mungi, Cania, Dee, Camboon, Boobygan, (good gold was obtained in this mine under the same conditions as previously mentioned) Black Snake, Kilkiven, Ban Ban, Marodin, Trebar, Cooyia, Cressbrook Creek, Charters Towers, Normanby (Cook District), and Cloncurry.

The occurrence of gold in Felstone Porphyries may be considered in this connection. Gold was obtained at Nanango and Ban Ban from a decomposed rock of this character, and the gold found in the Kilkiven diggings came from a hill of decomposed felstone porphyry which had been setting free its gold for ages, and it was into this hill that the celebrated Long Tunnel was driven, for the purpose of striking a reef which never existed, and the 200 tons procurred from this drive on being crushed only yielded a few pennyweights.

When gold occurs under these circumstances the most economical and satisfactory way of getting it out, is by imitating nature as nearly as possible by making large mounds of the stone, and assisting decomposition by acids, steam or water, and washing out the result. Such process might occupy $1\frac{1}{2}$ years; but the gold that could be obtained in this way in Queensland is enormous. Low class copper ore and the refuse of copper mines have been made to pay large dividends, by adopting this natural method.

The result of 20 years observations in Queensland, has led to the conclusion, that gold and other minerals, have been deposited or aggregated on certain lines, and these lines, in Queensland, run parallel with a line drawn north and south, 3½ degrees east of north of the Magnetic Meridian of the place, and it will be found that, if this line is drawn through any gold field or mineral deposit, the line if extended either north or south, will pass through some other gold field, and also indicate where deposits are likely to be found in future. I have also observed that gold increases in the reefs and leaders in the direction of the magnetic dip.

Since I first thought I saw the appearance of some law regulating the deposit of gold, I have watched for discoveries on known lines and found them verified. I had an idea that one of the lines would pass through two islands in the South Seas after passing through gold fields in Queensland, I communicated with some of the Government Agents, and Mr. M'Murdo, and Mr. Thompson, Government Agents, brought me specimens of stone from these islands, with the anticipated result.

I find also, that all ranges, or spurs, running parallel with this magnetic direction, contain mineral deposits, and that in gold reefing country, the gold lead keeps this line, irrespective of the direction of the reef, and when there are several parallel reefs, the gold as it were seems to hop from reef to reef, if the reefs are at an angle to this magnetic line; the gold remains in the reef, so long as the direction of the reef, and this line coincide. This holds good in Gympie, Caliope, Cania, Crocodile, Charters Towers, Gilbert, Ravenswood, Hodgkinson, and Normanby River. Where exceptions occur, the alteration is due to Secondary Reefs of later formation, crossing the ground, and cutting the older reef at an angle. Secondary Reefs occur at Gympie and the Hodgkinson.

Where a reef running north and south and dipping west carries gold, the gold will be found on the foot wall, and *visa versa*. Where a secondary reef cuts an older reef, running east and west, and dipping north, the gold is alway found adhering to the hanging wall.

Most reefs are filled up earth cracks, and during the cracking process, one side of the crack, in some instances, drops 2 or 3 feet, and at the same time launches end ways 2 or 3 feet, thereby bringing the projecting points, on either side, in many instances into contact, and so acting as natural dams, which check the flow of reef matter, during the process of filling up; in this case patches or deposits of gold, or other minerals,

will be found, where one would naturally expect them, for mechanical reasons, that is, on the upper side of the nips or pinches, in the direction from which the flow came, where the current of matter has been checked.

Some time ago, whilst in the neighbourhood of Kilkiven, I visited a reef that had been worked for some years with varying results, the outline of the hanging wall, when measured by a straight edge, and offsets, exactly corresponded with the foot wall 11ft. 6in. on the line of the reef and 3ft. 4in. below, so that one side of that reef had launched endways 11ft. 6in., and dropped 3ft. 4in.; there was consequently no difficulty, after seeing where patches had been found, in deciding where patches would be found in future.

The oxide of iron cement, or as the Cornishmen call it "Gossan," which occurs in many reefs, has never been subjected to a temperature higher than boiling water, the "burnt" appearance being the result of chemical change.

Copper, galena, and antimony deposits contain gold, in proportion to the nearness to the direction of the aforesaid magnetic line, but always on a spur or part of a range that is running in that direction.

A great deal of the gold obtained on the Palmer and Hodgkinson gold fields, comes out of the conglomerate, which, at one time, overlaid the vertical slate formation, to the extent of 100 square miles. Detached blocks of this conglomerate are scattered all over the Cook District gold fields, and most of the large nuggets which were found there, were attached to or associated with quartz of a rose pink colour, which colour does not exist in any of the reefs of that neighbourhood. This enormous mass of conglomerate is very difficult to account for, but underneath the conglomerate, the old water courses, eroded out of the "slate formation," can be seen filled up with a drift, in which there is no gold, totally distinct in character from the cemented conglomerate overhead. The face of the wall of conglomerate, in some cases, is 100ft. in height, and the time necessary to accumulate such a mass can hardly be estimated. Detached caps of conglomerate may occasionally be seen on the tops of peaks, corresponding in general level with the main mass.

In the Cook District an extensive lava stream has flowed into the old bed of the Normanby River, as mentioned in my article on "Springs and their origin" (pp. 28). This stream might be 50 square miles in area, and appears to average about 40ft. in thickness as far as I could judge, by driving an iron

tube down at the Springs, where a crack occurs. The bottom seems to be entirely composed of quartz shingle, and, as the course of this lava-flow has been along a basin, into which, for many miles, quartz reefs run; in the event of the bottom under that river bed being reached, I should say that the best deep lead yet discovered in Australia would be found there.

The deep lead at Gympie and this one could be easily bottomed, at a comparatively small expense, by using iron cylinders and compressed air, similar to those used by bridge engineers.

The alluvial ground on the Hodgkinson and Palmer, and several other fields, always present a knobbly appearance to a bird's eye view, or when seen from the top of a high mountain, such as would be produced by a layer of thin paste spread over a pie dish filled with plums, which correctly illustrates the appearance of the Hodgkinson from the top of Mount M'Can, and the Palmer, from the top of the Knobby, on the Granite Range, near Byerston.

These remarks have been compiled from old note books, and mainly with the object of creating inquiry and discussion, so as to assist in reducing mining enterprise to an exact science, and so prevent the enormous waste of capital at present employed in searching for minerals.

There is great difficulty in obtaining any information as to the past or intended working of any of the well known reefs that would be of any advantage to scientific mining. In most districts of the colony there are many individuals well versed in geology, but as to the mechanics of geology as bearing on the commercial aspect of the question, there is no information to be obtained.

DESCRIPTION OF EXOTIC FRUITS NEW TO QUEENSLAND:

BY

L. A. BERNAYS, Esq., F.L.S., &c.

(Read, 12th September, 1884).

I do not, I think, misinterpret the objects of the Society, in supposing that subjects which, in themselves, are not strictly within the realms of science, but which are concerned in promoting the material advancement of the country by adding to its resources or improving the food of its inhabitants, may be considered within the scope of our Transactions. This is especially the case in connection with the increase of the economic products of the soil; and I therefore offer no apology for bringing to your notice this evening two introduced trees, which—so far as my information goes—are now fruiting for the first time in Queensland. I am, at least, quite sure that these products are now, for the first time, brought to public notice, and their value explained.

Dillenia speciosa *Thunb.* or D. Indica *Linn.* is a medium sized evergreen tree attaining ordinarily a height of about 40ft., but, under favourable circumstances, growing considerably higher. The trunk is straight, but of no great height. Branches numerous, spreading, then ascending so as to form a most regular round dense shady head. The leaves are oblong, most regularly serrated, very firm, with many large elevated parrallel veins corresponding in numbers with and ending in the points of the serratures, about nine inches long by four broad. The rough, old leaves are used to polish ivory, horn, furniture, tinware, &c. The flowers are very large, white, and fragrant; the bright yellow anthers, which are very numerous, forming a large globe in the centre, crowned by white lanceolate spreading stigmas. The fruit is from three to four inches in diameter. The fleshy leaves of the calyx, when the fruit is fully matured, have an agreeable acid taste, and are eaten raw, cooked in curries, or made into sherbet. Inside are numerous reniform seeds surrounded by a pellucid glutinous liquid, used for making a palatable jelly, for a cough mixture, or a cooling

drink in fevers, and otherwise. The bark and leaves are both astringent, and are used medicinally. The timber is light brown, close and smooth grained, and is much used for gun stocks, handles, &c., and is especially valuable for its durability under water.

The tree is found in dense forests, at no great elevation, in all parts of tropical india, in the Peninsular, and in the Malayan Islands; and it is also commonly cultivated in India for its ornamental appearance, as well as for its uses.

Roxburgh speaking of Dillenia speciosa, says: "This when in "flower is one of the most beautiful trees I have ever seen." The specimen from which the fruit examples on the table are taken gives high promise, and that under conditions by no means favourable; and I am sanguine that from the crop of fruit now maturing hundreds of young plants will be available for planting on our rich coast lands in a few months. To the Acclimatisation Society is due the credit of fruiting this valuable stranger for the first time in Queensland.

Harpephyllum caffrum, *Bernh.* or Spondias caffra, *Meisner* belonging to the order *Terebinthaceæ* is a tree attaining from 20 to 30ft. of height and is a native of Caffraria. The leaves aggregate at the top of the branches, and being of a rich dark green produce a striking effect. The flowers are small and whitish on very stout pedicels; and are followed by a fruit in the form of an obovate, smooth, subfleshy drupe about an inch long, bright crimson when ripe, with a bony putamen. The proportion of flesh to stone is not large, but it has a pleasant sub-acid flavor; and while the fruit has no value for the table, it is by no means a contemptible addition to our garden products. The name is derived from *harpee* a sickle, and *phyllon* a leaf, in allusion to the falcate leaves. The Caffres call the tree "Eschenhout," and the edible fruit "Zuurebesges." The specimens of the fruit on the table are the produce of a tree in the plantations in front of the Houses of Parliament. I cannot say if it has fruited elsewhere; but a much larger and older specimen at Bowen Park has not yet been productive.

Both these trees may with advantage be largely cultivated for introduction into our gardens and plantations; and I hope that next season, when a supply may be fairly expected to be available, a large demand for them will have arisen.

DESCRIPTIONS OF NEW SNAKES WITH A SYNOPSIS OF THE GENUS HOPLOCEPHALUS.

BY

C. W. DE VIS, M.A.

(*Read on the* 12*th September*, 1884).

Hoplocephalus sulcans.

Scale rows 19 or 21 anteriorly; ventral plates 195-220; subcaudals 52-57. Rostral low, forming a rounded snout; nasal shield short; loreal replaced by postfrontal, nasal, labial and ocular; upper temporal in contact with both posterior oculars: lower wedged between last two labials; vertical longer than broad, with parallel exterior sides, an obtuse angle —or nearly straight edge—in front and an acute angle behind; labials $\frac{6}{6}$, the second and third upper ones in contact with the elongated anterior ocular. Head broad in the adult—very distinct from the neck. Habit elongate; ventral plates keeled on the edge Uniform bluish black or brown above: beneath plumbeous or yellow; a broad black lunate collar across the nape, produced forwards towards the angle of the mouth and turned up towards the occiput. A black spot between the tips of the occipitals. Postfrontals largely tipped with black: bar like spots on the lips and a elongate blotch on the angle of the upper lip. The space between the collar and the occiput much paler than the rest of the head.

Locality, Mitchell district, collected by Mr. C. W. de Burgh Birch.

The group of species with keeled ventrals claims this as a new member: to one of them—pallidiceps—it is not remotely allied. The name was suggested by an observation of Mr. de Burgh Birch that the snake can form its abdomen into a longitudinal furrow. It would be interesting to know whether the keeled ventrals are associated with faculty of climbing, as in the tree snakes.

Hoplocephalus vestigiatus.

Scale rows 15 anteriorly; ventral scales 152; subcaudals? Vertical narrow, elongate, obtusely angular in front, the acute angle rounded. Nasal elongate, replacing the loreal. Third

labial hardly touching the anterior ocular. Upper anterior temporal touching both posterior oculars: lower wedged between last two labials. Labials $\frac{6}{6}$. Scales rather thick and rugose, hinder angle rather produced and spatuliform. Above blue black; each scale of the back with a white mark on each side of the base.

One specimen in damaged condition from an uncertain locality.

Cacophis warro.

Scales in 15 rows; ventral plates 143; subcaudals $\frac{15}{15}$; anal bifid. Rostral shield broad and low, rounded anteriorly. Nasal shield single, short. Loreal replaced by the postfrontal, which is in contact with the 3rd and 4th labials. The fourth labial and ocular equally form the fore edge of the orbit. Upper anterior temporal in contact with both posterior oculars. Lower temporal wedged in between penultimate and last labials. Vertical broad in front with an obtuse anterior, acute posterior angle, and converging sides. Scales broad, smooth, rhomboidal, with the acute angles truncated. Tail short. Habit stout. Brown, many of the scales irregularly edged with darker, producing a speckled appearance. On the nape, a very broad lunated collar. Upper surface of head, except the tips of the occipitals, dark, but paler than the nuchal collar.

Locality, Warro Station, Port Curtis, collected by Mr. F. A. Blackman.

Brachysoma sutherlandi.

Scales in 17 rows. Ventral plates 160. Subcaudal plates $\frac{40}{40}$. Anal plate bifid. The rostral shield is broad, truncated in front, and extends backwards to the level of the nostril. Nasal shield single, extended backwards to replace the loreal, and separating the postfrontal from the labials. The anterior ocular and third labial equally form the fore edge of the orbit. The occipital and last labial are in contact on the one side of the head, on the other separate, and allowing the anterior temporal to come into contact with the lower posterior ocular; labials $\frac{6}{6}$. vertical an elongate hexagon with obtuse anterior, acute posterior angle and nearly parallel exterior edges. Scales smooth, rhomboidal, with the acute angles truncated. Red brown above, becoming bright on the head, and passing into sienna yellow below: a broad lunar black band, edged with paler, across the nape; a faint band over the head at the vertex: a second over the tip of the snout. Body and tail with

ten faint half bands across the back, the last on the tip of the tail.

Locality, Carl Creek, Norman River: collected by Mr. J. Sutherland.

KEY TO THE GENUS HOPLOCEPHALUS.

A. Scales round the fore part of the body in 21 rows.
- *a.* Ventral shields with alternating colours as on the back .. .. *stephensii.*
- *b.* Ventral shields at the corner, and outer row of scales yellow ... ... *variegatus.*

B. Scales round the fore part of the body in 21 or 19 rows
- *a.* Head with spots, lips blotched... ... *sulcans.*

C. Scales in 19 rows ... ... *temporalis.*

D. „ „ 18 rows anteriorly, 19 posteriorly ... *curtus.*

E. „ „ 17 rows
- *a.* Body banded—ventrals with lateral keel ... ... *ornatus.*
- *b.* black, without markings ... ... *ater.*
- *c.* a white streak along the temple ... *signatus.*

F. Scales in 15 rows
- *a.* without markings; tongue white ... *nigrescens.*
- *b.* nearly without markings; head pale *pallidiceps.*
- *c.* with a dark line down the back;
  - *a** the head and line black ... ... *nigrostriatus.*
  - *b** „ „ darker than the rest of the body ... ... *ramsayi.*
  - *c** the head pale... ... ... *superbus, young.*
- *d.* with varied markings
  - *a** a collar across the neck
    - *a*** a white streak from the tip of the snout to the upper lip ... *mastersii.*
    - *b*** a white and a black streak along the face joining the collar .. *coronatus.*
    - *c*** a half collar ... . *minor.*
  - *b** a spot near the corner of the mouth *minor.*
  - *c** Scales, each with two white marks *vestigiatus.*
  - *d** a red spot on each of the two outer scales ... ... *superbus.*
  - *e** Head black ... ... *nigriceps.*
  - *f** „ with black spots and blotches *spectabilis.*
  - *g** „ crown and nape black ... *gouldii.*

OBSERVATIONS ON OCCURRENCE OF GOLD AT "MOUNT MORGAN," NEAR ROCKHAMPTON.

BY

HON. A. C. GREGORY, C.M.G., F.R.G.S., ETC.

(*Read on the 12th September*, 1884).

CONSIDERABLE interest having been excited by reports of the discovery of gold under exceptional conditions at "Mount Morgan," in the Dee Ranges, near Rockhampton, it may be useful to give a description of the actual character of the ore in which the gold has been found, and also of the conditions necessary to its economic treatment.

The veinstone, or ore, has the general appearance of an irregular mass of cellular quartz, the cavities of which are filled with oxide of iron, with only a small quantity of visible gold irregularly distributed. On examining the oxide of iron under a microscope, after it has been subjected to pressure and friction, numerous very minute particles of gold are seen.

The condition of the quartz is crystalline, and in the usual forms common to the ordinary aqueous deposits of metalliferous veins, and the cavities which are now filled with oxide of iron, show by their structure, that they were originally occupied by crystals of sulphide of iron (or iron pyrites). There is no trace of any action of heat or of alteration by the contiguity of volcanic rocks as has been surmised by some, the condition of the stone clearly indicating that it has originally been a true metalliferous vein which has been decomposed by atmospheric action, the component parts chiefly consisting of auriferous iron pyrites, with a gangue of quartz. The structure of the quartz would lead to the inference that the specimens had been taken

from a special enlargement of the vein, or what the miners term "a blow," and consequently it may be expected that the extension, horizontally on either side of the first discovery, will present a narrower but well defined lode of auriferous pyrites but that the lode at the point of discovery will continue of considerable dimensions to some depth, and that the whole will prove to be a true metalliferous vein of the class which extend downwards beyond the limit of practical mining operations.

The general geological features of the country are those of a granitic anticlinal axis with thick beds of serpentine rocks and altered slates of the Devonian period resting on the flanks, while horizontal sandstones of mesozoic age are found capping some of the hills and ranges, but have been largely removed by denudation.

It is chiefly in the Devonian rocks that metalliferous deposits are found, and more especially where they have to some extent been altered to serpentine, while the existence of veins of magnesian silicates may be considered a favourable indication of auriferous deposits.

As most of the gold workings in this district, and indeed in Australia, have been in auriferous quartz, with only a proportion of auriferous pyrites, the existence of a large deposit, almost exclusively consisting of auriferous pyrites, is no doubt a novelty to miners accustomed to other conditions; but in Europe and America pyrites have been worked for more than a hundred years with profit, even when the gold has been less than one millionth part of the ore.

One important consideration in working gold ores of the character found at Mount Morgan is that the ordinary stamp mills with amalgamated plates and mercury riffles, though they may collect a considerable part of the gold, will fail to save a large percentage of the very fine gold, both on account of the particles being covered with oxide of iron, and also that the oxide of iron having a higher specific gravity than quartz is more difficult to seperate by washing; and it will be necessary to subject the whole of the finer part of the tailings to amalgamation in pans or barrels, in contact with mercury and wrought iron.

Fortunately the surface ore at Mount Morgan is so completely oxidized by atmospheric action that the whole of the sulphur has been dissipated, and only gold, oxide of iron, and

quartz, remain; and the only difficulty is the finely divided condition of the precious metal; but as the workings progress, the pyrites will present itself in a less decomposed state, and eventually when the level of permanent water is reached, the whole will appear in the condition of a bright, brassy-colored "mundic," in which the gold will be contained in such minute particles as to resist direct amalgamation, and the ore will have to be roasted at a low heat to drive off the sulphur.

Hitherto this roasting process has been the stumbling block of the miner in this colony. They know that a low heat will slowly set free the gold in the sulphide, and therefore assume that more heat will do the work quicker; but the higher heat partially fuses the ore, and the gold is hopelessly entangled and lost, and it is for this reason that kiln or clamp burning quartz, though rendering it easier to crush, has failed in economic results.

The process best suited for working auriferous pyrites is first to crush the stone and then to concentrate the pyrites by washing. It is then roasted at a low heat; at first so low that it is scarcely red hot, the greatest care being taken to avoid fusion. When the sulphur is driven off in the condition of sulphurous acid, and the iron being oxidized to a fine red powder, from which the gold may be separated by amalgamation in any of the pans, or other amalgamators, one important feature being that the rubbing surfaces should be in part wrought iron, the chemical reaction of which assists in keeping the mercury in proper condition to take up the gold.

ON NEW FISH FROM MORETON BAY.

BY

C. W. De VIS, M.A.

(*Read on the 12th September*, 1884.)

Owing to the local interest attaching to the fish of Moreton Bay, I am induced to draw the attention of this Society to some apparently undescribed ones lately captured by the "Queensland Fishing Association," and other friends.

SERRANUS GEOMETRICUS.

D. 11/16. A. 3/8. Lat. 85.

The height of the body is 4 nearly, the length of the head $3\frac{1}{3}$ in the total length; orbit nearly 5, snout $3\frac{4}{5}$, interorbit 7 in the length of the head. Preoperculum finely serrated, the serrations a little coarser near the angle. The maxillary extends beyond the middle of the eye. Caudal truncate above, rounded below. Fifth dorsal spine the longest, $3\frac{1}{3}$ in the length of the head. Red, with 4–5 faintly darker red cross bands, more conspicuous posteriorly; first dorsal with a conspicuous triangular black edge between each spine, the apex of the triangle scarlet.

Locality, Moreton Bay.

SERRANUS VIRIDIPINNIS.

D. 11/16. A. 3/8. Lat. 70.

The height of the body is 4 nearly, the length of the head $3\frac{1}{3}$ in the total length; orbit $4\frac{1}{2}$, snout $3\frac{3}{4}$, interorbit 6 in the length of the head; opercle with two points; caudal rounded; maxillary extending to the hinder edge of the orbit. Lower jaw the longer. Fifth dorsal spine the longest, $2\frac{3}{4}$ in the length of the head; preoperculum rather strong, serrated; especially at angle, emarginate above the angle. Red, each scale with a subocellated white spot. Fins green, more or

less stained with red. A broad red blotch on the base of the pectoral. Tips of dorsal webs bright yellow. Lower lip within violet blue.

Locality, Moreton Bay.

Genyoroge amabilis.

D. 11/14. A. 3/8. Lat. 75.

The height of the body is $3\frac{1}{3}$, the length of the head $3\frac{2}{3}$ in the total length. Orbit 4 nearly, snout $2\frac{2}{3}$, interorbit $4\frac{2}{3}$ in the length of the head. Preopercular notch distinct, but small; caudal strongly emarginate. The pectorals do not reach the anal. The upper maxillary reaches the fore edge of the orbit. Preopercle finely serrated above the notch. Red, fading to pinky white on the lower parts, but intenser on the head, where it forms a curved nuchal band and interorbital patch. Orbit yellow, that colour extending on the preorbital. A broad ill defined yellow band from the preoperculum to the caudal. First dorsal and pectoral pink. Second dorsal and anal light pink at base, crimson in the middle, and broadly white edged. Caudal crimson edged with yellow. Length, 14in.

Locality, Moreton Bay.

Genyoroge regia.

D. 11/15. A. 3/10. Lat. 85.

The height of the body is $2\frac{4}{5}$, the length of the head $3\frac{2}{3}$, in the total length. Orbit $5\frac{1}{3}$, second dorsal spine $2\frac{2}{3}$ in the length of the head. Habit elevated. Caudal strongly emarginated. Soft dorsal and anal peaked, the middle rays being the longest. Operculum, with a scarcely distinguishable point. Preoperculum finely serrated on hinder limb, more finely on lower, and with a small notch. Maxillary reaching anterior third of the eye: canines very small. Pectoral reaching beyond the origin of the anal. Basal third or more of soft dorsal and anal scaly. Second dorsal spine longest. Pink, each scale with a pearly base. A broad red stripe from the muzzle through the eye to the nape; a second broader, and increasing in breadth and intensity, from the first dorsal to the abdomen; a third fainter, from the end of the first dorsal to the caudal peduncle. Fore half of soft dorsal and of anal, tips of caudal lobes, webs of ventral, and axillary patch reddish black. Basal half of pectoral, and mesial portion of second dorsal and anal bright red. Apical half of pectoral, anal, and soft dorsal pink.

Locality, Moreton Bay, collected by Mr. O. Gardner.

Lethrinus imperialis.

D. 10/9. A. 3/5. Lat. 50. Tr. 4/16.

The height of the body is rather less than $\frac{1}{3}$ (as 15 to 47) of the total length of the body; the length of the head still less (as 14 to 47). Orbit 5, snout $1\frac{2}{3}$ in the length of the head. Operculum scaly. Cheek naked, but posteriorly impressed on the surface as by embedded scales. Head above naked to the nape. Form oval, percoid. Snout produced, rather concave above. Canines $\frac{4}{4}$; lateral teeth conical, not contiguous; no posterior canine. Caudal forked. First two dorsal spines short; third more than twice as long as the second, and the longest. Third anal spine much the longest. Light purplish red; most of the scales of the back being purplish at the base. Upper part of head stained with scarlet, which forms a pale curved band across the occiput, and an intense one bounding the orbit below, and running over the posterior nostril. Gape and within the mouth, a band across the base of the pectoral, and an axillary patch bright scarlet. First dorsal mostly scarlet, streaky greenish grey at the base. Second dorsal and anal greenish, passing into red towards the edge. Caudal broadly edged with red. Pectoral light red. Ventral scarlet at base, rays violet, and webs brownish purple.

Locality, Moreton Bay.

Cossyphus aurifer.

D. 12/10. A. 3/12. Lat. 35. Tr. 6/13.

The height of the body is $3\frac{1}{2}$, the length of the head $3\frac{4}{5}$ in the total length. Orbit $5\frac{1}{2}$, snout 3, interorbit $3\frac{1}{2}$ in the length of the head. No posterior canine; cheek with subimbricate scales. Scaly sheath of the dorsal beginning beneath the 5th spine. Profile convex. Preoperculum entire. Caudal truncate with lobes much produced. The first dorsal rises over the middle of the base of the pectoral; ventral with the first ray the longest. Red, paler on the chin; scales edged with darker red. First eight dorsal spines black. A pale blotch beneath the 8-9 dorsal spine, and edged with black. Head covered with golden spots. Length 18in.

Locality, Moreton Bay.

SALARIAS GALEATUS.

D. 12/18. A. 22.

The height of the body is $5\frac{1}{2}$ in the total length; head the same. A high rounded crest on the head — not continuous with the dorsal fin. No tentacles. No canines. Dorsal not notched; spinous portion rather arched, soft, gradually rising to a considerable height; the eighth to the fifteenth rays filamentose; the whole not continued on to the caudal. Caudal forked; its lobes a little filamentose. Profile of snout nearly vertical. Dark brown, paler posteriorly, with small scattered and few black spots. A dark longitudinal line or two on the first dorsal.

Locality, St. Helena; living in the recesses of coral and very active. All these little fish turn upon their capturers, and those with canine teeth readily draw blood. Collected by Mr. D. Macpherson, a zealous correspondent.

CHŒROPS VENUSTUS.

D. 13/17. A. 3/10. Lat. 29. Tr. 3/9.

No posterior canine. Serrature of preopercle rather indistinct. Head obtuse, as high as long. Preorbital high; half of the length of the head. Caudal truncate, with the lobes a little prolonged. Scales of cheeks in 9-10 rows—subimbricate. Colour (recent) pale blueish-green, pretty uniform, or with the side pale crimson, and the belly pale flesh colour, with a pale blue spot more or less distinct on each scale. A blue or purple line round the eye; before the eye, a yellow patch, with a blue or purple bar in its middle, and a blue or purple spot above and below it; chin and throat light blue, becoming purplish over the angle of the preoperculum. Upper rays and base of each ray of the pectoral, azure blue. Base of fin, yellow. Anal yellow, with a broad submarginal band of blue, broken up posteriorly by the ground colour: a bright blue band, or series of large spots, at the base. Dorsal yellow, with a similar band at the base: a broad band of blue spots, more or less confluent, in the middle; and a narrow blue edge. Caudal greenish yellow, with some of the middle, or all of the rays, azure blue. Muzzle with blue dots on a yellow ground. Upper lip blue; edge of maxillary yellow. Length to 22 inches.

Locality, Moreton Bay.

CONTRIBUTIONS TO THE QUEENSLAND FLORA.

PART III.

BY

F. M. BAILEY, F.L.S., Government Botanist.

(Plate xviii.)

(*Read on the 12th September*, 1884.)

ORDER RUTACEÆ.

Boronia anemonifolia var. anethifolia.
Hab. Stanthorpe (J. Davidson.)

ORDER COMPOSITÆ.

Senecio velleioides, *A. Cunn.*
Hab. Main Range (C. H. Hartmann.)

ORDER SAPINDACEÆ.

Diploglottis diphyllostegia, *F.v.M.*

Following Baron Mueller's first description of this tree in *Fragm. Vol. V.*, it will be found in "The Synopsis of the Queensland Flora" under Plumier's genus Cupania. In *Fragm. Vol. IX. p.* 90, the learned Botanist of Victoria abandons the idea of giving to the tree the rank of a species and leaves it as a mere variety of the well known native Tamarind, Diploglottis Cunninghamii *Hook. f.* That it is a tree of very different habit and much more valuable as a shade giving tree than the native Tamarind anyone would at once admit upon seeing the trees of each species growing at Bowen Park, irrespective of the botanical difference in the inflorescence. The trees now flowering at Bowen Park were collected by the writer about twelve years ago in the dense scrub of the upper part of the Herbert River where it forms one of the largest scrub trees. The leaves

are smaller, of a thinner texture, and not so densely rusty tomentose as the common native Tamarind, the inflorescence is more lax also, and the flowers contain five petals, differences quite sufficient to constitute a separate species.

Hab. Mount Elliot (Kilner & Fitzalan.) Rockingham Bay (Dallachy.) Herbert River (Bailey.)

ORDER ORCHIDEÆ.

Dendrobium Adæ, *Sp. Nov.*

Stems about 1ft. long slender, furrowed, bearing at their summit usually 3 leaves and 1 or 2 short racemes of white highly fragrant flowers. Leaves lanceolate 3 or 4in. long, and about 1in. wide at the broadest part, the texture rather thin prominently keeled underneath. Racemes 1 to 3in. long bearing 2 to 4 flowers. The bracts small, narrow-lanceolate. Pedicels about $\frac{1}{2}$in. long. Sepals or outer segments about $\frac{1}{2}$in. long and somewhat ovate, the lateral ones slightly falcate, spur or pouch short and curved. Petals or inner segments rather shorter and narrower than the outer. Labellum shorter than the other segments, the lateral lobes glabrous faintly marked with purple bars, middle lobe cordate and densely tomentose, with 3 close raised lines along the disc reaching to the base of the middle lobe. Column short white. Anther white. Pollen masses rather small, pale yellow. This desirable addition to the Queensland Dendrobiums by its slender stems and leaves approaches D. gracilicaule, *F.v.M.*, while the form of the flowers is more that of D. Kingianum, *Bidw.*, but is quite distinct. The specific name is in honour of Mrs. J. W. R. Stuart.

Hab. Scrubs between Herberton and Mourilyan Harbour, Collected by J. W. R. Stuart.

ORDER JUNCACEÆ.

TRIBE XEROTEÆ.

Xanthorrhæa quadrangulata, *F.v.M.*
Hab. Mount Perry (Jas. Keys.)

Until met with by Mr. Keys at Mount Perry this Grass-tree was considered to be confined to South Australia.

TRIBE EUJUNCEÆ.

Juncus planifolius, *R. Br.*
Hab. Helidon Waterfalls (B. Crow.)

ORDER LYCOPODIACEÆ.

Lycopodium tetrapterygium, *Sp. Nov.*

This species has the tassel-like inflorescence of L. Billardieri, and L. phlegmaria; but differs from each in the direction of the stem leaves, which, in the present species, are twisted half round, so as to form four even wings along the stem, thereby presenting a marked distinctive character to the plant.

Hab. On trees, Daintree River (Fitzalan), Johnstone River (W. R. Kefford).

ORDER FILICES.

Lomaria membranacea, *Colenso*, *Spec. Filic.* *Vol. III*, *p.* 34.

Hab., Johnstone River (W. R. Kefford).

A plant, which is evidently the above growing in the bush-house at Bowen Park, Mr. Kefford tells me he found on the Johnstone River. This is most interesting, as it is the first time the species has been met with it out of New Zealand.

ORDER MUSCI.

Funaria sphærocarpa, *C. Muell.*
Hab. near Brisbane (Bailey.)

Cyathophorum, *Beauv.*
C. pteridioides, *Beauv.* *(C. pennatum, Brid.)*
Hab. Johnstone River (W. R. Kefford.)

Phyllogonium cymbifolioides, *C. Muell.*
Hab. Southern Queensland (Bailey.)

Neckera Baileyana, *C. Muell.*
Hab. Southern Queensland (Bailey.)

Distichophyllum, *Dozy. et Molkenb.*
D. (Mniadelphus) Baileyanus, *C. Muell.*
Hab. Helidon Waterfalls (Bailey.)

ORDER HEPATICÆ,

Metzgeria, *Raddi.*
M. furcata, *Nees.*
Hab. Keppel Bay (M. A. Thozet.)

M. hamata, *Linderb.*
Hab. Southern Queensland (Bailey.)

ORDER CHARACEÆ.

Nitella cristata, *Al. Br.*
Hab. water about Highfields Main Range (Bailey.)

N. diffusa, *Al. Br.*
Hab. Fassifern (Bailey.)

Chara gymnopitys, *Al. Br.*
Hab. Ithaca Creek (Bailey.)

ORDER LICHENES.

Ricasolia rhaphispora, *Chas. Knight, Sp. Nov.* (Pl. xviii.; fig. 1)

Thallus glauco-pallescens inequalis tenuiter membranaceus, passim lævis passim rugulosus, lobatus, lobis rotundato-crenatis (prominentiis mastoideis nullis) subtus pallidus, ambitu nudus, rhizinis obscuris. Apothecia badio-rufa (latit. circa 2.5 mm.) submarginalia, margine integro. Sporæ elongato-fusiformes sæpissime solum 1-septatæ longit. 0.073 mm. crassit. .003 mm.

Differs from *R. crenulata* var. *stenospora*, Nyl. in the margin of the apothecia being entire instead of lacero-crenate. R. *dichroa* also has elongated narrow spores, but the thallus is lurid fuscous beneath, and the whole plant larger and coarser than *R. rhaphispora.*

Hab. on bark of scrub trees, southern Queensland (Bailey.)

Parmelia sphærospora, *C. Knight in Trans. Linn, Soc. Vol. II, Part 2, 1882.*
Hab. on rocks Glasshouse Mountain (Bailey.)

Lecanora (Hæmatomma) Babingtonii *C. Knight.*
Hab. On Bark, Southern Queensland (Bailey.)

Thelotrema trypethelioides, *C. Knight, Sp. Nov.* (Pl. xviii; fig. 2.)

Thallus *viridis* creberime verrucosus crassus continuus verrucis convexis v. hemisphoricis singulis v. plures in colliculo congestis Apothecia singula v. plures in singulis verrucis immersa; ostiolum commune minutum depressum, mox annulatim late expansum, tum profunde urceolatum, disco albo margineque prominente, excipulo proprio tenui ab lateribus atro-fusco, Apotheciorum verrucis intus omnino carbonizatis vel dense atro-laminatis, laminis erectis; paraphysibus gracilibus, non bene discretis. Sporæ in ascis cylindraceis pediculiformes 3-septatæ long. 0.015 mm. crassit, 0.008 mm.

Ad cortice arborum. Leg F. M. Bailey.

Fig. (a) section of verruca with more than one apothecium (× 40); (b) do-do with only one apothecium. Two spores (x 900.)

Obs. Allied to *Thelotrema schizostomum* (Syn. Trypethelium schizostomum, *Leighton.*)

Hab. on bark of Scrub Trees, Brisbane (Bailey.)

Ascidium octoloculare, *C. Knight, Sp. Nov.* (Pl. xviii.; fig. 3.)

Thallus glauco-viridis v. ochraceo-viridis tenuis continuus, verrucis apotheciorum convexis concoloribus (lat. 0. 8mm.) ostiola minutissima, excipulo proprio nullo, paraphysibus e flavo-virescentibus chlorophylli granis per strata arcte adglutinata dispositis. Asci non visi. Sporæ fusiformes incolores 7-septatæ (rare 3-septatæ.)

Hab. on Brisbane Scrub Trees (Bailey.)

Lecidea (Bilimbia) quadrilocularis, *C. Knight, Sp. Nov.* (Pl. xviii.; fig. 4.)

Thallus granuloso-furfuraceus virescens effusus passim evanescens. Apothecia minuta (lat. circa 0.5 mm.) numerosa luteo-carnea v. subaurantiaca convexa vel subglobosa immarginata, hypothecio dilute colorato, paraphysibus gracilissimis plurimum clathratis. Sporæ fusiformes rectæ 3-septatæ incolores long. .02 mm. crassit. .003 mm. *Ad cortices.*

Allied to *Lecidea sphæroides*, but thallus darker, apothecia one-third less in size; paraphyses much branched, and spores much more slender.

Hab. on bark of trees at Lytton (Bailey.)

Lecidea (Biatorina) planella, *Nyl.*

Hab. on bark, Enoggera scrubs (Bailey)

Lecidea (Psora) rhypoderma, *C. Knight, Lich. of N.Z.*

L. foliata var. atrovirens, *C. Knight.*

Hab. on bark of trees, Fassifern (Bailey.)

Chiodecton stromaticum, *C. Knight, Lich. of N.S.W., Trans, Linn Soc. Lond.*

Hab. on bark of trees, Indooroopilly (Bailey.)

Trypethelium rubrum, *C. Knight, Sp. Nov.* (Pl. xviii.; fig. 5.)

Thallus cruentus, verrucis (latit. circiter 1.2 mm.) sape monopyreniis primitus convexis *concoloribus*, demum subconoideis nigrescentibus, ostiolo papillato nudo nigro areola albidula cincto, excipulo e verruca carbonizata formato; paraphysibus subtilissimis discretis. Sporæ in ascis cylindraceis oblongæ

utrinquerotundæ fuscidulæ 4-*cellulæ*, *cellulis lenticularibus nonnihil quadratis*, emortuæ fuscæ, longit. 0.024 mm. crassit, 0.012 mm.
Hab. on bark of trees Brisbane scrubs (Bailey.)

Verrucaria velata, *Turn.*
Hab. on bark of trees, Fassifern (Bailey.)

ORDER FUNGI.

Polyporus applanatus, *Fr.*
Hab. on trees in dense scrubs (Bailey.)

Corticium rhabarbarinum, *B. et Br.*
Hab. on wood, Queensland scrubs (Bailey.)

Hexagona similis, *Berk.*
Hab. on wood, Queensland scrubs (Bailey.)

Peziza aluticolor, *Berk.*
Hab on wood, Main Range (Bailey.)

Hypomyces, *Tul.*
H. chrysospermus, *Tul.*
Hab. on Polyporus, near Brisbane (H. Tryon.)

Hypoxylon flavo-fuscum, *B. et Br.*, *Sp. Nov. Mss.*
Hab. on stumps of "blady grass," Humpybong (Dr. Joseph Bancroft.)

Dothidea, *Fries.*
D. nitidula, *B. et Br.*, *Sp. Nov. Mss.*

Hab. on Fimbristylis, near Northcote (R. C. Burton.)

The object of the writer in bringing under the notice of the Society from time to time these lists of additions to the Colony's Flora is that persons taking an interest in the subject may have reliable data as to the extent of our Flora; whilst at the same time the opportunity is taken of now and again making special notices of already recorded species. Including those of the present list, it will be observed that nearly two hundred plants have been thus noticed as occurring in Queensland since the publication of the writer's work, "The Synopsis of the Queensland Flora," about one-fourth being new plants.

NOTES ON THE FAUNA OF THE GULF OF CARPENTARIA.

BY

C. W. DE VIS, M.A.

(*Read on the* 12*th September*, 1884.)

In July last Mr. K. Broadbent, during his progress in the north, paid a visit to Kimberley, at the mouth of the Norman River: a locality which, some years ago, he examined for novelties with success. On the last occasion, he unfortunately found the country around suffering much from drought, the nearest water being twenty miles away. Circumstances so untoward forbade a long stay: but, at the same time, made the collection found of greater interest, since we may reasonably suppose, that its contents represent no small portion of the permanent inhabitants of the neighbourhood at that season. A few mammals, some sixty kinds of birds, and two or three lizards, were procured or observed. The importance of recording the present distribution of animal and vegetable life in our country urges me to ask a place in the Society's Proceedings for the following list :—

MAMMALS.

Mus delicatulus, *Gould.* A solitary example which, on account of the inconsistent differences in its proportions, might have been considered as new; with the same length of body (6.4 c m), it has a much longer tail (7.0), longer ears (1.2), a shorter head (2.15), and shorter hind foot (1.8). But, in colouring, it is fairly well represented by Mr. Gould's description, and I therefore hesitate to distinguish it.

Mus sp.

These small rats, apparently undescribed, I propose to bring under notice on a subsequent occasion.

Perameles bougainvillei, *Q and G.*

Onychogalea annulicada, *n.s.* *(Pg.* 157.*)*

BIRDS.

Nisaetus morphnoides, *Gld.* a pair. Of the male, Mr. Broadbent says 'I found him eating a rat on the ground in a small scrub:' the female was 'found camped in a small white gum on a sand ridge, in the early morning.

Pandion leucocephalus *Gld.* parents, and newly hatched young from a nest in a dead tree on a sand ridge.

Hieracidea orientalis. *Schl.*

Falco lunulatus, *Lath.*

Cerchneis cenchroides, *Vig and Hors.*

Ninox boobook, *Lath.*

,, connivens, *Lath.*

Caprimulgus macrourus, *Hors.*

Lagenoplastes ariel, *Gld.*

Dacelo cervina, *Gld.*

Artamus superciliosus, *Gld.*

,, personatus, *Gld.*

,, albiventris, *Gld.*

Pardalotus uropygialis, *Gld.*

Grauculus melanops, *Lath.* The only species seen.

Campephaga humeralis, *Gld.*

Pachycephala rufiventris, *Lath.*

,, lanoides, *Gld.* A rare bird received by Mr. Gould from the north-west coast. Two males and a female in fine plumage were obtained. Mr. Gould's description of the bird in his "Handbook," p. 215, is correct, his original diagnosis (Proc. of Zool. Soc. pt. VII. p. 142), alone given by Mr. Sharpe, (Brit. Mus. Cat. of Birds V. 8. p. 224) contains an important error.

Collyriocincla harmonica, *Lath.*

Seisura inquieta, *Lath.*

Rhipidura tricolor, *Vieill.*

Rhipidura phasiana *n.s.* (*Pg.* 159.)

Micræca pallida *n.s.* (*Pg.* 158.)

Gerygone mastersii, *Masters-Sharpe.* Agreeing with Mr. Ramsay that this is a good species, I adopt Mr. Sharpe's suggestion as to the name it should bear.

Gerygone albogularis, *Gld.*

Eopsaltria pulverulenta, *Bp.*

Malurus lamberti, *Vig. and Hors.*

Anthus australis, *Vig. and Hors.*

Cisticola exilis, *Lath.*

Cinclorhamphus cruralis, *Vig. and Hors.*

Zonæginthus bichenovii, *Vig. and Hors.*

Chlamydodera nuchalis, *Jar. and Selb.*
Corone australis, *Gmel.*
Corvus coronoides, *Vig. and Hors*, much less common than *australis*. Mr. Broadbent observes on these specimens "there are no hackles to speak of."
Glyciphila ocularis, *Gld.*
Ptilotis sonora, *Gld.*
„ unicolor, *Gld.*
„ plumula, *Gld.*
Acanthochæra rufigularis, *Gld.* "Small gums on sand ridges."
Melithreptus lætior, *Gld.* The honey-eater described by Mr. Gould from a collection made in the Northern Territory and regarded by Mr. Sharpe as a very old male of *M. gularis* in full breeding plumage, is a good species; eight examples male and female, all with the specific characters, are conspicuously distinct from *gularis*.
Melithreptus vinitinctus *n.s.* *(Pg.* 159*)*.
Zosterops lutea, *Gld.*
Sitella leucoptera, *Gld.*
Cacatua galerita, *Lath.*
„ sanguinea, *Gld.* "One flock seen going south, July 9th."
Ptistes coccineopterus, *Gld.* This and several honey-eaters were observed feeding amongst the red flowers of the Cork Tree. *Erythrina indica.*
Melopsittacus undulatus, *Shaw.* "Seen going south, July 10th."
Stictopelia cuneata, *Lath.*
Lobivanellus miles, *Bodd.*
Himantopus leucocephalus, *Gld.*
Numenius uropygialis, *Gld.*

BIRDS SEEN BUT NOT PROCURED.

Falco subniger, *Gld.*
Gypoictinia melanosternon, *Gld.*
Haliætus leucogaster, *Gmel.*
Strix delicatula, *Gld.*
Halcyon sanctus, *Vig. and Hors.*
Grallina picata, *Lath.*
Malurus brownii, *Vig. and Hors.*
Oriolus viridis, *Lath.*
Eupodotis australis, *Gr.*

SNAKE.

Pseudechis australis, *Gr.*

TORTOISE.

Elseya dentata, *Gr.*

LIZARDS.

Monitor gouldii. The only 'guana' seen.
Œdura fracticolor, *n.s.* (*Pg.* 160.)

DESCRIPTION OF THE NEW SPECIES REFERRED TO IN THE ABOVE LIST.

ONYCHOGALEA ANNULICAUDA, *n.s.*

It was with no small interest that the only Macropod in the collection was found to be a fourth species of the Nail-tailed Wallabies (Onychogalea), undoubtedly a natural group. The alliance characters of the three long known species, the nail-like tip to the tail and the peculiar shoulder marking differentiating them from all others, are present in our new acquaintance, but in the one case exaggerated, the nail resembling the broad head of an arrow, in the other partly effaced. The example of the new species is unfortunately but one and that a young female. The adult male is probably somewhat smaller than O. lunulata.

Fur moderately long and rather adpressed. Habit slender. Head rather short with a convex profile. Ears moderately pointed. Tail long, compressed, well clothed on the sides, with a dorsal crest of stiffer hairs beginning at about the fore third and increasing in length towards the tip on which it forms a brush scarcely hiding the nail. Nail broad, spear-shaped, with a low culmen towards the tip. Tarsi long, the fourth toe extending much beyond the outer and inner ones. General colour fawn grey, of a lighter and duller tint beneath. Fore part of the snout nearly black: upper surface of head grizzled with black and rufous, fading to buff on the eye brows and base of ears. Behind the ear a small patch of very short dark hair: before it a dark patch extending about half way along the face. Side of face as the body but a little brighter. On the lower edge of the face a faintly darker stripe to the angle of the mouth. Behind the shoulders a faint trace of a curved pale stripe from the direction of the nape. Ears grey on the outside, black at the base on the inner, buffy towards the tip. A long faint pale stripe on the haunch directed toward the rump. A broad pale brown dorsal stripe from the occiput to the fore third of the tail. Middle part of the tail light grey with broad dark grey rings beginning faintly and distantly and becoming blacker and

closer till they form the rusty black posterior fourth and pure black tip of the tail. Fore limbs silvery grey, hind limbs as the body, claws black.

Total length ...	84.5	c.m.	Ear externally ...	5.2	c.m.
Length of tail ...	42.25	„	Hind foot	16.2	„
„ „ head „ to outer base of ears	8.4	„	Distance from tip of fifth to tip of fourth toe	4.4	„
Length of snout from eye ...	4.3	„			

Resembles *unguifer* of the north-west coast rather than the two more ornate species *frœnata* and *lunata*, but readily distinguished by its ringed tail, continuous dorsal line, black muzzle, and distinct trace of a shoulder stripe.

Concerning the habits of this animal, Mr. Broadbent remarks "that it frequents open plain country or salt-pans intervening between sand ridges where it is found usually solitary," and that "it makes a lair in the tussocks occuring in such situations, having similar habits in this respect to the kangaroo-rat. It is shy and difficult of approach."

Rhipidura phasiana *n.s.*

Above brownish grey, becoming slightly rufous on the mantle. Feathers of the head minutely tipped with pale grey; those of the back narrowly edged with rufous. Upper tail coverts brown; a few of them with lighter tips. A large white spot above the eyes, continued as an indistinct rufous band to the side of the occiput. Lore, side of the head and ear coverts dark brown; the latter edged with white. Throat and lower part of the side of the neck white. Upper part of breast grey; lower part buff, fading into buffy white on the lower part of the abdomen and under tail coverts. Wings brown. The inner secondaries broadly edged with white. All the feathers of the shoulder and the wing coverts largely tipped with white. Primaries with dark brown shafts. Tail, dark brown; all but the two middle feathers, with entirely white shafts. The external feather with the outer web, tip and apical half of inner web white. The next brown on the outer web; white on the tip and web; the rest gradually losing the white portion. Middle feathers wholly brown. Legs, feet, and bill very dark brown. Total length 1.49 c.m. Tail 1.2. Wing 6.3. Length of gape 1.2. Culmen. 9. Breadth of bill at base. 6.

Locality, Kimberley, collected by Mr. K. Broadbent.

I should have regarded this bird, a spirit specimen in indifferent condition, as very probably an example of Mr. Ramsay's *R. episcopus*; but I presume that the tail feathers of that species have brown shafts, as it is associated by its describer with R. pectoralis *H. and J.*; and R.maculipectus Gr. It is not unlike R. cervina. *Ram.* from Lord Howe's island, but differs in the distinctly spotted character of its wing markings and in being less in all its dimensions.

MICRÆCA PALLIDA *n.s.*

Head and all the upper surface of the body light brownish grey; wings dark brown; the primaries very narrowly edged and tipped with white, the secondaries more broadly. Tail dark brown; the two central feathers uniform; the two external on each side white; the next brown on the basal half, or rather more, of the inner web; the next white tipped: the subcentrals narrowly white edged. Lore, and a line over the eye white. All beneath white, tinged on the chest and sides, with very pale brown. Length 11.2 c.m. Tail 5.7. Tarsus 1.35. Culmen 0.95. Breadth of bill at gape 0.85. Wing 7.7.

Locality, Kimberley.

MELITHREPTUS VINITINCTUS.

Upper surface vinous grey, becoming darker on the head; olive green on the mantle, rump, and upper tail coverts. A blackish brown stripe on the side of the head, commencing narrower on the base of the culmen, expanding over the ear coverts, and continued thence faintly down the side of the neck. A narrow white lunate occipital band from orbit to orbit. Wings and tail brown. Edges of primaries, outer webs of secondaries, and lateral tail feathers, and whole of central tail feathers, olive green. All beneath silky white. Under wing coverts white. Primaries and secondaries, with their inner webs edged with greyish white. Beak brown, with the tip black; basal half of lower mandible yellow. Feet light brown. Iris brown. Total length 10.3 c.m. ($4\frac{1}{5}$). Culmen 1.5. Wing 6.2 (2.45). Tarsus 1.45 (5.51).

Locality, Kimberley. Found by Mr. K. Broadbent feeding on the small eucalyptuses fringing the plains. This, the smallest and most delicate form of the group, seems to have its nearest ally in the *M. breviceps* of New South Wales.

ŒDURA FRACTICOLOR *n.s.*

Labials 9/8. The snout is $2\frac{1}{4}$ in the length of the head, and equals the interorbit. The chevron plates, on the outer toes, in six, on the other toes in nine pairs. No tubercles on the base of tail. Grey; a darker grey stripe runs from the angle of the mouth to the shoulder: above it, a second from the middle of the orbit to and along the side of the back: a third from the upper part of the orbit goes to the nape, and is continuous with its fellow of the opposite side. The lateral stripes are joined by backwardly curved transverse bands, which alone are continued on the tail All these are linear, and in the brightest specimens are edged posteriorly with white spots, most evident on the tail, which is thus crossed by pairs of short black and white bars. In most examples the spots are obsolete, and the lines are broken up into irregular streaks and spots. In some the grey ground colour is by the disappearance of the lines, almost uninterrupted. Total length 9.3 c.m. Tail 4. Head 1.4.

Locality, Kimberley, collected by Mr. K. Broadbent.

fig. 1.

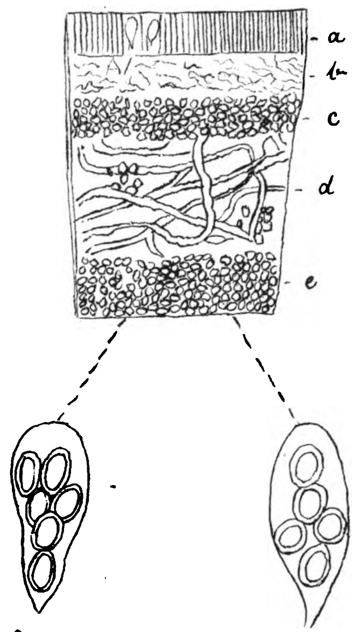


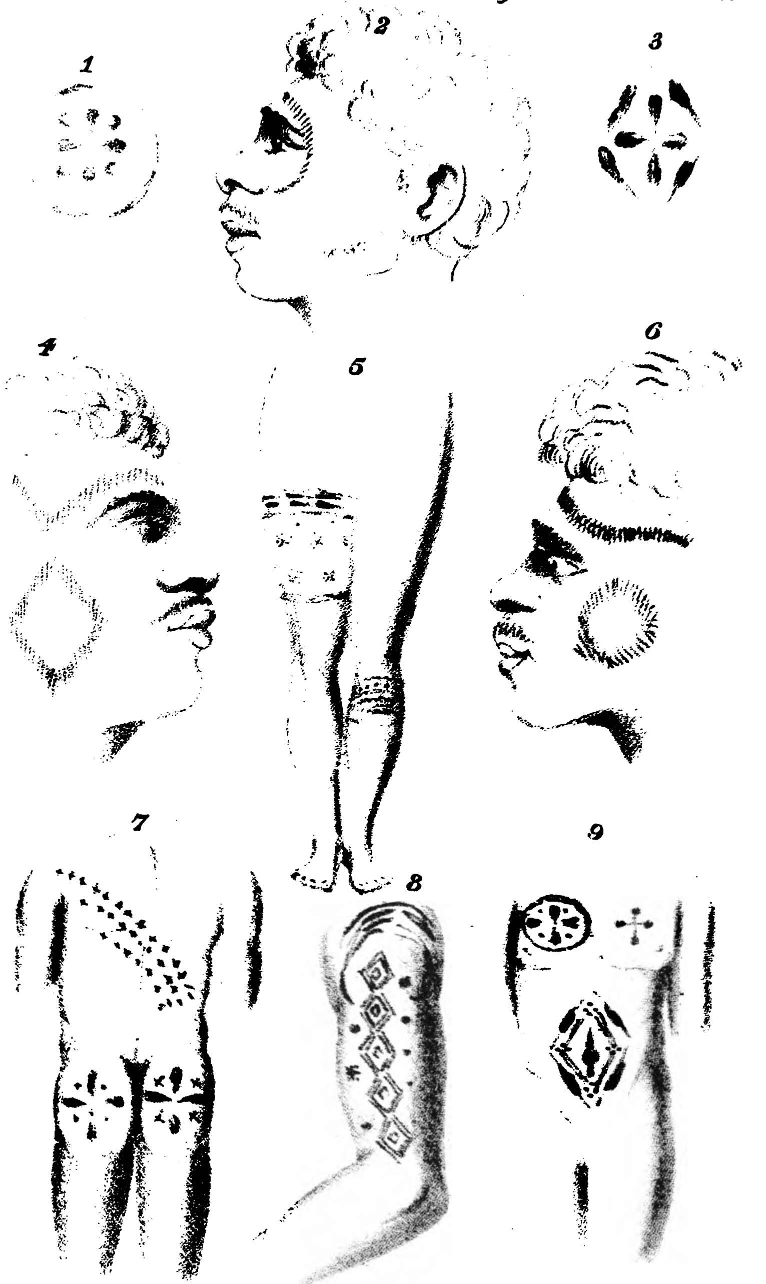
fig. 2.

fig. 3.

Thysanothecium Campbelli. Knight.

C. Knight. Well. N.Z. del.

J. O'Connor. lith.



CUTTINGS ON THE FLESH OF
NEW IRELANDERS.

A. J. Duffield del.

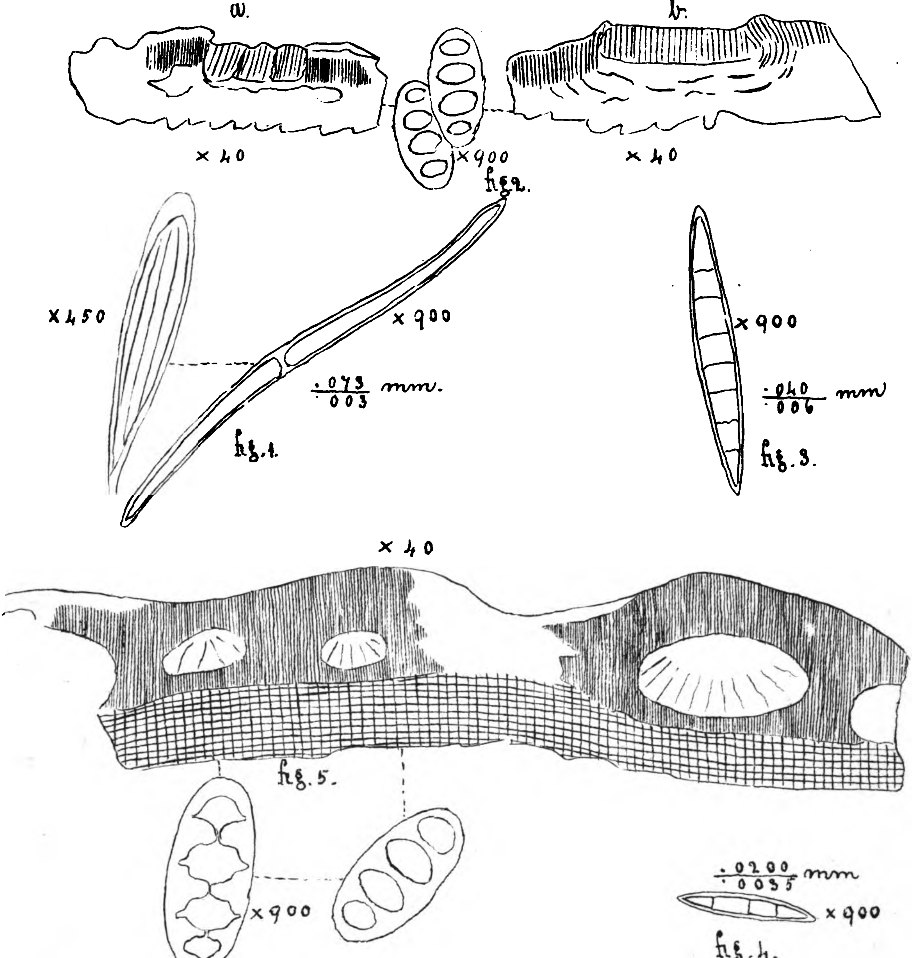


fig 1 *Ricasolia rhapispora*, Knight.
" 2 *Thelotrema trypethelioides*, Knight. no: 40
3 *Ascidium octoloculare*, Knight. no: 204.
4 *Lecidea (Bilimbia) quadrilocularis*, Knight. no: 320
5 *Trypethelium rubrum*, Knight.

C. Knight Well. N. Z. del. J. O'Connor. lith.

CONTENTS OF VOL. I. PART III.

THE PROCEEDINGS

OF THE

ROYAL SOCIETY

OF

QUEENSLAND.

1884.

VOL. I. PART IV.

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1885.

FRIDAY, 10TH OCTOBER, 1884.

THE PRESIDENT J. BANCROFT, ESQ., M.D., IN THE CHAIR.

The following new members were elected:—F. Mawe, Esq., Charters Towers; John Cameron, Esq. (Sen.), Brisbane; H. W. Radford, Esq., Brisbane; W. C. Hume, Esq., Toowoomba.

The following donations were announced.—

"Maps and Sections to accompany the report of the Royal Commission of 1871, on British coalfields." From the Hon. A. C. Gregory, C.M.G.

"Proceedings and Transactions of the Royal Society of Canada for the years 1882 and 1883," Volume I., Montreal, 1883. From the Society.

"Journal of the Royal Society of New South Wales," Vol. XVII., 1883, Sydney, 1884. From the Society.

"Notes on two Australian Species of Trigona," by Harold J. Hockings. [*Proceedings Entomological Society of London, August*, 1883.] From the Author.

"Geology," by John J. Stephenson, Ph. D., with an Appendix.

"On the Carboniferous Invertebrate Fossils of New Mexico," prepared by C. A. White, M D. [*The U.S Geographical Surveys West of* 100*th Meridian*, Vol. III., *Supplement. Washington*, 1881.] From the Hon. A. C. Gregory, C.M.G.

The Australian Irrigationist," No. 2, Melbourne, 1884. From the Editor.

The following Paper was read:—

A PLEA FOR THE PRACTICE OF HYBRIDISATION OF PLANTS,

BY

JAMES PINK, ESQ., F.R.H.S., BRISBANE BOTANICAL GARDENS.

(Read on 10th October, 1884.)

The produce of vegetation as found in its primitive state conduces little in a direct manner to the maintenance of civilised man, and it is not until it has been improved by culture that it is really of any value to the world in general. This beneficial

result has been brought about by the practice of the arts of cultivation and hybridisation. In this short paper I intend to deal with the latter of these, viz:—hybridisation, including cross-fertilisation.

It may be fairly assumed that in the origin of vegetation distinct species only were in existence, all other forms being merely varieties of such species; and this opinion is confirmed by the fact that, even at the present day, botanists are unable to define what strictly constitutes a species.

It is only within a comparatively recent date that the organs of fructification of flowers have been thoroughly understood, although the ancients appear to have had certain ideas as to the sexuality of flowers. Empedocles and Anaxagoras in the fifth century before the Christian era, claim for vegetables the same sexuality as animals; and Herodotus states that the Greek cultivators of the date, Phœnix dactylifera, brought the flowers from the male plants and attached them to the fruit-bearing trees, that the produce might attain maturity.

Yet it was not till 1787 that any great improvements had been effected in varieties of fruits and vegetables. In that year, Thomas Andrew Knight, President of the Royal Horticultural Society of England, commenced his experiments in hybridisation, which he carried on uninterruptedly for forty years, since which time the general appearance of our cultivated plants has very much changed. It matters not whether we look to the useful or to the ornamental department of the vegetable kingdom—at the beautiful flowers that adorn our gardens and add a charm to our daily lives; or to the more useful, the fruits and vegetables that supply our wants. In each department is the thought and skill of man apparent, as year by year new forms of beauty are added to our already large list of flowers, and new and improved varieties to our stock of fruits and vegetables.

For years past both the Queensland Acclimatisation Society and the officers of the Brisbane Botanic Gardens have searched the world for fruits and plants of economic value; and with great success as the garden and orchards throughout the colony testify. But here the matter has ended; with the exception of one solitary instance—so far as I am aware—no endeavour has been made to improve such plants by raising indigenous hybrids, for it is only by such means that plants can be really acclimatised. Some one has truly said that plants like men thrive best on their native soil.

The one exception to which I referred is that of our President, Dr. Bancroft, who has succeded in raising a new and indigenous

variety of grape by hybridising or crossing the Isabel with the Sweetwater, the former being the mother and the Sweetwater the father of the new variety. This was done as an experiment, and no great result could have been expected of it. To have raised a really improved and valuable hybrid I would have suggested the crossing of the Muscat of Alexandria with the Isabel. This cross would probably result in a distinct break in our varieties of grapes, and by such means we might obtain a hybrid possessing the hardness and productiveness of the Isabel with the large and delicious fruit of the Muscat.

The art of practical hybridisation is very simple in itself, but it is absolutely necessary for the operator to have a knowledge of the various parts of the flower, and especially of the functions of the organs of fructification. A typical perfectly formed flower is composed of a calyx, corolla, stamens, and pistil. It is with the two latter essential organs that the hybridist has to deal. The pistil is the central organ of the flower and is divided into three parts, the ovary, style, and stigma. The ovary is that part of the pistil which is to contain the future seed. The stigma is the moist, spungy surface destined to receive the pollen-grains by which the ovules are fertilised, and the style is the column supporting the stigma, through which the pollen-tubes pass to the ovary. A stamen consists of a stalk called a filament and the anther containing the pollen-grains. It is by conveying the pollen-grains from the anthers of the flowers of one distinct species or variety to the stigma of the flower of another species or variety that the practical process of hybridisation is effected. Hybridisation is one of the most interesting departments in the whole field of horticulture, and one which from its simplicity can be carried to a successful issue by anyone especially after having once seen the operation performed. Morning and evening, in fine weather, are the best times for effecting the process.

It will be well to glance for a moment at what other countries have effected by hybridisation. Take America as an example, and where America has led surely Australia can follow, and in her turn raise hybrid fruit of her own, better adapted to her climate than imported kinds.

America in the early days of her history did exactly as we are doing, that is, introduced all her fruits from the Old World, with various results. The apple as introduced from Europe would not thrive, neither is it indigenous to America, and early writers say that nearly all the varieties had degenerated to the normal state of "crabs." As soon, however, as Knight had promulgated his theory of crossing and hybridising, through the agency of the

Royal Horticultural Society, the Americans, ever ready at grasping improved ideas, at once commenced experiments in raising new varieties of apples by means of artificial hybridisation. The result is that at the present day America has the finest collection of apples of any country in the world, and these all raised on her own soil. So local are many of these varieties, that they will not thrive out of the State in which they were raised. As with apples so with grapes. The early American colonists crossed the European varieties with the native grape, Vitis labrusca. This latter unfortunately gives to all the American varieties a slightly "foxy" flavour, but it also gives them a strong constitution and large productive powers, and California is to-day reaping the benefit of the exertions of her early settlers, in both grapes and apples.

To improve our own grapes I think we could not do better than follow the example of America, and cross the best European or American varieties with one of our native kinds, as a basis for further hybrids. I have been informed by several gentlemen that there is growing around Cooktown one of the tuberous-rooted varieties of grape. I have never seen this plant, but I very much wish to do so, for if it is only half as good as the description given me—which I have no reason to doubt—here is the very thing to our hands: a plant with a fleshy tuberous root, and consequently capable of withstanding any amount of drought, nature having adapted it to the position it occupies, and from which an endless variety of Australian hybrids might be raised perfectly suited to our climate.

I am quite aware that there have been in the past tens of thousands of chance seedling fruits such as oranges and peaches raised in this colony, yet we never get a peach equal to the original varieties as grown in Europe, in consequence of all the European kinds degenerating when imported here. The cause of the lack of improvement in these seedlings is that they have been raised from seed produced from flowers left to fertilise themselves, or to chance fertilisation by insect agency, instead of by judicious hybridisation.

Hybridisation and cross breeding of plants have now become a science of which the results in either fruit or flowers are made an almost absolute certainty. The hybridist should have a clear conception of what he wishes to obtain, and then operate on the two varieties possessing the desired qualities that he wishes to concentrate in one. For instance, take two varieties of oranges or peaches as the case may be. One is a very hardy and productive variety that can be always depended

on for a crop, but its fruit is of inferior quality. Another variety may be of weakly constitution and a shy bearer, but its fruit is superb, and we think if the robust hardy variety would only produce fruit equal to the weakly kind what a grand thing it would be. That can never be; but there is no reason why a hybrid should not be raised, a distinct cross between the two, combining the hardiness and productiveness of the one with the superior quality of the other. To accomplish this flowers of the robust variety should be fertilised with pollen from the flowers of the weaker kinds, thus making the strong-constitutioned plant the seed bearer. If this were properly carried out the result would be a certainty; the hybrid seedling possessing the strength of the mother plant with the high qualities of the male parent. It is rare that the progeny of two distinct varieties represent the parents in a perfectly intermediate degree but the general habit is usually that of the mother or seed-bearing parent. No absolute principle can be laid down on this point, but as a rule the strongest constitution should be made the seed-bearer.

Dropping from the useful to the ornamental, there is another wide field open to the labours of the hybridist. There is not a flower of any standard growing in our gardens that has not been more or less civilised or improved by this art. All our hybrid perpetual roses originated in a cross between Rosa damascena and the perpetual chinensis, and from this group all our hybrid Noisettes, and Tea, and scented roses have been raised. Again, it is now difficult to realise that one of the commonest and showiest flowers grown here (the geranium) is the result of a simple cross of a variety growing wild in S. Africa with the small-flowered and sweetly-scented, foliaged G. citriodora. But so it is, and still new varieties are being added—the result of artificial fertilisation.

It has long been considered an undeniable fact, that distinct species will not cross. It has always been a stock argument that no one has ever yet succeeded in crossing the apple with the pear; the gooseberry with the currant; or the raspberry with the strawberry. Last season this fallacy was swept away by Mr. Culverwell (*Gardener's Chronicle*, Vol. XIX., No. 490), who succeeded in crossing the gooseberry with the black current and raising seedlings the result of the cross; and also in raising hybrids from crossing the strawberry with the raspberry.

These successes have opened up to scientists a vista of unlimited possibilities, and the full effects of which on our orchards and gardens it is impossible at present to anticipate.

FRIDAY, 14TH NOVEMBER, 1884.

HON. A. C. GREGORY, C.M.G., F.R.G.S., ETC., IN THE CHAIR.

The following were duly elected Members of the Society, viz., Richard E. Sexton, Esq., Stud. Inst. C. E., Pine Hill; J. W. Anderson, Esq., M.A., L.L.D., Rockhampton; E. A. Phillips, Esq., Pine Hill.

The following donations were announced:—

1. "Reports on the exhibits at the Crystal Palace Electrical Exhibition, 1882." Washington, 1882. From the Smithsonian Institution.

2. "Reports of Geological Explorations, during 1883—84." Wellington, 1884. "Meteorological Report 1883." Wellington, 1884. From the Director, Colonial Museum and Geological Survey of New Zealand.

3. "The Higher Branch of Science or Materialism Refuted by Facts," by H. J. Browne. Melbourne, 1884. From the Author.

4. "Russkago Geographicheskago, Obshtchestva," Transactions, Vol. XX. Pt. 1 and 2, and Proceedings 1883. St. Petersburg, 1884. From the Imperial Geographical Society.

5. "Rendiconto delle sessioni dell accademia delle scienze dell Instituo di Bologna, 1882-83." Bologna, 1883. From the Institute of Bologna.

6. "Report of Progress 1880-81-82." Montreal, 1883. "Maps to accompany Report of Progress, 1880-81-82." Montreal, 1883. "List of Publications of the Geological and Natural History Survey of Canada." Ottawa, 1884. From the Director Geological and Natural History Survey of Canada.

7. "Australian Irrigationist, No. 3." Melbourne, 1884. From the Editor.

The following papers were read:—

A CONSPECT OF THE GENUS HETEROPUS.

BY C. W. DE VIS., M.A.

(*Read on the 14th November*, 1884.)

The members of this genus of small ground lizards appear to form a very natural group, andone more closely allied to the mokos(Mocoa) than to the Tropidolepismas with which they have been associated by Drs. Gray and Günther. Their mutual affinity

is apparent throughout their characters but nowhere more plainly than in the similarity of their head shields. The fifth upper labial is generally, if not always the largest and under the orbit. The nasals are distant from one another, and the nasal orifice central or in the hinder half of the shield, sharply edged posteriorly, without any curvilinear grove replacing the margin. The postfrontals approximate only: the vertical and interparietal differ but moderately from each other in size and shape: the interoccipital is very small. The paired shields following the single postmental are three to four, of which the first two are sub-equal. The legs are moderately strong and by no means far apart. The genus is not entirely confined to Australia, but it would appear from Mr Macleay's discoveries, and from the species represented in the Queensland Museum, that its chie developement has been within Australian limits.

HETEROPUS, *Fitzinger*.

"Muzzle conical: nostrils lateral, in the middle of a nasal plate: supranasal none, naso-frontal single, teeth conical, simple: palate not toothed, with a deep triangular notch behind: ears distinct, open: lower eyelid transparent: body elongate, cylindrical: sides rounded: scales keeled: legs 4, far apart: toes 4-5 elongate, rather compressed, simple, clawed: hinder unequal; tail conical, pointed."

KEY TO THE SPECIES

Scales of the back.

2 keeled—

a. keels sharp ... ... *lateralis.*
b. ,, obtuse ... ... *blackmanni.*

3 keeled—

a. ears without projecting scales in front
  i beneath uniform ... ... *schmeltzii.*
  ii ,, particoloured ... ... *pectoralis.*
b. ears with three projecting scales in front
  i the upper scale largest ... .. *rubricatus.*
  ii several above small ... ... *longipes.*
  iii small ones all round the edge ... *rostralis.*
c. ears with 5-6 projecting scales in front
  i distinctly white spotted ... ... *maculatus.*
  ii apparently dark lined ... ... *sexdentatus.*

5 keeled—

a. ears with one projecting scale in front *rhomboidalis.*
b. ears with three projecting scales in front ... ... *quinquecarinatus.*

Indistinctly keeled—

a. ears with one strong scale in front, one or two small ones on each side of it	*variegatus.*
b. ears with three projecting scales in front	*cheverti.*
c. ears simple edged or nearly so	*mundus.*

HETEROPUS LATERALIS, *N.S.*

Scales of the back and tail strongly bicarinate, the keels continued nearly to the tip of the tail. Ear orifice with a single long and low scale on the fore edge, sometimes divided; scale rows 30, labials $\frac{7}{8}$, the fifth upper one the largest and under the orbit, second and third postmentals sub-equal, tail short.

*Length of the head	... 1.05	Length between the limbs	1.85
„ „ gape	... 0.75	„ of hind limb	... 1.70
„ „ trunk	... 2.95	„ „ fore limb	... 1.25
„ „ tail	... 4.80	Breadth of the head	... 0.70

Above bronze-brown. On the upper edge of the flanks between the limbs a bright copper-red stripe. Beneath bronze, blue, and yellow. Average adult length 3in. Locality, Moreton Bay district.

HETEROPUS BLACKMANNI, *N.S.*

Scales of the back more or less faintly ridged, anteriorly more or less sharply: distinctly bicarinate posteriorily; ear orifice longitudinally elliptical, narrow, fringed with small free scales on the upper edge Scale rows 32, labials $\frac{7}{7}$, the fifth upper one the largest and under the orbit. Second and third postmentals sub-equal. Tail moderately long.

Length of the head	... 0·95	Length between the limbs	1·7
„ „ gape	... 0·65	„ of hind limb	... 1·5
„ „ trunk	... 2·55	„ of fore limb	... 1·15
„ „ tail	... 4·65	Breadth of the head	... 0·6

Pale to dark olive brown, speckled with white and darker brown: a distinct white line along the upper lip and through the ear to the shoulder is continued brightly or faintly along the flanks. A lateral line from above the ear appears as a line of pale specks or distinct line on the edge of the back. Head bronze green.

Locality, Port Curtis. Collected by Mr. F. A. Blackman.

HETEROPUS SCHMELTZII, *Peters.*

"Agreeing with H. schlegelii, and therefore distinct from H. fuscus and peronii, in having but 7 supralabials, the prefrontals separated, the nuchal scales distinctly more keeled, and the

* The measurements are in centimetres.

dorsal scales three keeled. The ear orifice has no projecting scales on its front edge, but is furnished with one or two short but high rounded scales conspicuous from their pale colour. Scales of the body in 36 longitudinal rows. Of the two examples sent to me by Hr. J. D. E. Schmeltz from the Museum-Goddeffroyi, the larger (total length ·0123 m., to the base of the tail ·051 m.) is uniform olive brown above, on each side of the back with a rather distant bright stripe, below yellow (that colour relatively narrow), above dark olive green with small black and white specks. On the side of the body and upper surface of the limbs speckled with black and white, and from the nasal runs a yellowish white line, which passing under the eye goes through the middle of the ear orifice and loses itself on the side of the body over the fore limb. The under side is greenish white, and from the hinder part of the lower lip runs a dark line which dies out on the side of the throat between the longitudinal rows of scales." From Rockhampton, North Australia. Mon. Akad. Berl., 1867, xiii.

HETEROPUS PECTORALIS, *N.S.*

Labials, $\frac{7}{7}$. Prefrontal single, postfrontals approximate, nasals distant. Nostrils small, subcentral. Palpebral disk large. Ear orifice with one small (on one side), or a few minute (on the other side) free scales on the edge. Postoccipital scales nearly smooth; a few rows of nuchal scales quadricarinate; the rest, the dorsal scales, and those of the outer surface of the hind-limb narrowly and sharply tricarinate; those of the fore-limb nearly smooth. Habit stout. Scales in 32 rows.

Length of the trunk ...	5·2	Length between limbs ...	2·15
(Tail reproduced)		„ of hind limb ...	2·0
Length of head	1·2	„ fore limb ...	1·4
„ gape	0·85	Breadth of head	0·85

Olive grey above, each scale narrowly black-edged all round. A bright red lateral stripe on the edge of the back. Lower surface of fore-limb, side of chest, and flanks red. A large patch on chest and upper part of abdomen cream color (orange in life). Upper surface of head pale golden green spotted with black, throat and side of head pale blue, brightly varied with a broad black hinder edge to each scale.

Locality, Warro, Port Curtis. Collected by Mr. F. A. Blackman; one specimen.

HETEROPUS MACULATUS, *N.S.*

Labials, $\frac{8}{7}$. Prefrontal single, postfrontals approximate, nasals distant, nuchal scales faintly ridged, dorsals tricarinate, scale rows 36. Habit short and stout, head short, tail very long;

ear with a row of 5-6 free scales fringing the fore edge, gradually diminishing in size from the topmost one.

Length of trunk ...	2·75	Length between the limbs ...	1·55
„ head ...	1·15	„ of hind limb	2·1
„ gape ...	0·9	„ fore limb	1·55
„ tail	8·2	Breadth of head	0 75

Above bronzy brown with a vertebral stripe and a broader lateral one on each side black, the latter running over the ear and through the eye to the snout. From the upper lip a fainter dark stripe runs below the ear to the shoulder. Upper surface of the body studded with black-edged greenish white spots which run in pairs along the base of the tail. Head without spots, beneath yellowish bronzy-blue, anteriorly pinky, yellow posteriorly.

Locality, Cape York. Collected by Mr. K. Broadbent.

HETEROPUS RUBRICATUS, *N.S.*

Scales of the back very faintly tricarinate. Ear orifice with three free scales on the fore-edge, the upper one the largest. Scale rows 36. Labials $\frac{7}{6}$, the fifth upper one the largest and under the orbit. Second and third postmentals the largest. Tail long.

Length of the head ...	1·55	Length between the limbs	2·05
„ „ gape ...	1·2	„ of hind limb ...	3·1
„ „ trunk ...	3·7	„ fore limb ...	1·9
„ „ tail	9·75	Breadth of the head ...	0·8

Above uniform brown. On the sides and limbs rather bright rufous brown. A stripe of the ground colour, edged above and below with white, runs through the eye from the snout to the shoulders. Beneath yellowish, tinged with blue anteriorly.

Locality, Cape York. Collected by Mr. K. Broadbent.

HETEROPUS LONGIPES, *Macleay*.

"Nasal plates small and distant, the internasal forms a broad straight suture with the rostral, and is rounded in the middle of its base where it joins the frontal; frontal-nasal large and nearly contiguous; frontoparietal single, with a small rounded interparietal behind. The fifth upper labial is the largest. Ear openings slightly ovate, with acute denticulations, the three in front large and several above small. Legs, especially the anterior pair long and weak, the toes elongate and unequal. Scales very indistinctly 3 keeled, those on the back in 8 or 10 series. Color olive-brown above with a darker streak on each side; beneath yellowish white; central preanal scale large; tail long and taper; total length, six inches. Endeavour River." Proc. Lin. Soc., N.S.W., ii, 66.

HETEROPUS ROSTRALIS, *N.S.*

The posterior nuchal scales with 3 very obtuse keels which grow more distinct on the back and vanish on the tail. Ear orifice small, semicircular, with 3 free scales on its fore-edge, the upper one much the largest, and a series of smaller ones round its circuit. Scale rows 32. Labials $\frac{7}{8}$, the fifth upper one the largest, and under the orbit. Second and third postmentals subequal. Tail moderate.

Length of the head ...	1·55	Length between the limbs	2·55
„ „ gape ...	1·05	„ of hind limb ...	3·35
„ „ trunk ...	4·65	„ fore limb	2·15
„ „ tail	8·20	Breadth of head	1.00

Above shining olive-brown, uniform. A short pale line on the edge of the neck above a rather broad dark stripe from the ear to the shoulder. Beneath pale bluish-brown on the tail and limbs, becoming pure pale-blue on the throat, upper lip, and rostral shield.

Locality, Cardwell.

HETEROPUS SEXDENTATUS, *Macleay.*

"Head short, the supraorbital regions rather elevated; nostril in the middle of the nasal plate; fifth upper labial largest; other head plates as in the last described species. Ear openings oblongovate, with six denticulations in front. Legs, moderate; toes, elongate; scales indistinctly tricarinated, those on the back in 8 series. Tail, fine tapering, a little longer than the body. Colour, olive-brown above and greenish-white beneath. The scales of the back and sides have their lateral angles tipped with dark-brown, which gives the appearance of a number of dark longitudinal lines. Length, 6 inches. Cape Grenville." Proc. Lin. Soc., N.S.W., ii, 67.

HETEROPUS RHOMBOIDALIS, *Peters.*

"Scales smooth or very indistinctly 5 keeled, in 32 longitudinal rows, ear orifice round, moderate, with one projecting scale in front, nasal entirely lateral, internasal nearly twice as broad as long, prefrontal divided, frontal truncated before and behind. The entire frontoparietal united with the interparietal into a single rhomboidal shield, besides the 4 supraorbitals a small fifth one behind. The transparent disk of the lower eyelid large, 7 supralabials of which the fifth and largest is under the eye. The fore limb reaches to the front edge of the eye, the hinder with the fourth toe to the armpit, above brown with an ill-defined black band on either side beginning at the ear orifice; on either side of the back a row of black specks,

beneath altogether yellowish green, or with the region of the chin bluish. Examples of this species from Port Mackay, N.E. Australia, are in the Goddefroy collection." Mon. Akad. Berl. 1869, p. 446.

HETEROPUS QUINQUECARINATUS, *Macleay*.

Head rather blunt, nostril near the middle of the nasal plate, the sixth upper labial largest, the other head plates as in the two last species (H. longipes and variegatus). Ear openings oblong-oval, with three denticulations in front, legs moderate, toes slightly elongated, scales each with five keels, the lateral ones short and indistinct, and those on the back in about six series, tail scarcely longer than the body, colour dark brown above and white below, with a light black-edged side streak. Length 6in. Hab. Darnley Island. Proc. Lin. Soc., N.S.W., ii, 67.

HETEROPUS VARIEGATUS, *Macleay*.

Plates of the head as in the last species (H. longipes); nostril on the hinder part of the nasal plate, ear openings oval, with a strong denticulation in front, and one or two minute ones on each side of it. Legs stronger and shorter than in the last species, the toes much shorter, tail long and taper. Scales indistinctly keeled, those on the back in 8 series. Colour, dark olive brown on the back with a few distant lighter-coloured spots representing obsolete stripes, and a broad black band along each side, edged with yellow, under surface yellowish. Length 5 inches. Darnley Island. Proc. Lin. Soc., N.S.W., ii, 67.

HETEROPUS CHEVERTI, *Macleay*.

"Head flat; nostril at the back part of the nasal plate; fifth upper labial largest; head plates as in all the other species, the interparietal perhaps being more pointed at the apex. Ear openings nearly round, with three denticulations in front. Legs moderate; toes elongate; scales very indistinctly carinated, the keels showing more as points on the edge of the scale than on it, those on the back in 8 series. Tail considerably longer than the body, and very acutely pointed. Colour greenish, olive above, bluish white beneath, the under side of the legs and tail being of a somewhat pinker hue. Length, 5 inches. Barrow Island." Proc. Lin. Soc., N.S.W., ii, 67.

HETEROPUS MUNDUS, *N.S.*

Labials 7-7, the fifth upper beneath the eye. Nasals very small, orifice central. Ear simple edged, or with one or two

minute scales in front, two small scales on the upper edge, scales of upper surface nearly smooth. Habit rather slender, scales in thirty rows.

Length of the trunk ...	3·7	Length between the limbs ...	1·8
(Tail reproduced) ...	0·0	„ of hind limb	1·5
Length of the head ...	1·0	„ „ fore „	1·25
„ „ gape ...	0·75	Breadth of head	0·7

Olive, varied above with sublinearly disposed spots, anteriorly black, posteriorly white, on the loins the white marks become short rectangular bars, anterior upper labials white edged above, a white line from the preorbital to upper hinder edge of ear orifice, recommencing below it, forming a distinct white line to over the axil, then fading on the flanks: over the shoulders an indistinct pale line, the space between this and the lower line reddish. Throat black lined, mental shields broadly black edged.

Locality Warro, Port Curtis, collected by Mr. F. A. Blackman. Two specimens.

HETEROPUS FUSCUS, *Dum. et Bibr.*

"Lower eyelid transparent. Scales of neck smooth, of back three keeled. Inhab. Isle Waigiou and Rawach." Gray, Brit. Mus. Cat. Liz. 107.

Other localities given are Torres Straits. Gth. An. Mag. N.H. (4) 19. 413. Murray Island, Gth. Loc. Cit. 1879-84. Peak Downs.

SUMMER HEAT AND HEALTH

BY

HENRY WYATT RADFORD.

Of which the following is an abstract :—

The origin of the heat of the body and the natural processes by which its normal degree of temperature is maintained, were treated of; also the attention to be given to our diet, clothing, exercise, and mode of living generally in order that these processes may be assisted in their operation. The many ill effects resulting from a neglect of the measures advocated for securing this condition of health were also exemplified by copious illustrations.

NOTES.

A whale (Ziphius layardi, Flower) *recently stranded near Southport*, Plate xix.—An opportunity of examining in the flesh any of the Australian whales so seldom occurs, that when found it should be made a note of. Between Saturday and Sunday last a small whale being discovered stranded on the Southport beach, was as soon as possible forwarded to the Museum where it arrived on Tuesday morning. It was found to be a young female of one of the Ziphiidæ or Beaked whales. The general form is that of a long double cone, with the tail anterior to the flanks vertically compressed. The jaws equal in length and somewhat curved, ascending slightly from before the middle to the tips and abruptly to the angle of the gape. The eye small and in a line with the angle of the mouth. The blow-hole on the top of the head a little in front of the level of the eye, curved with its end turned forwards. The pectorals small. The dorsal rather larger and slightly falcate. The flukes broad and with a low medial ridge in the vertebral line. The skin entirely naked, dull black above, purplish-black on the lower parts where it is marked by numerous scars, old and fresh. The epiderm thin but firm, not deciduous as in the dugong. Corium about $\frac{1}{2}$ to $\frac{1}{3}$ inch thick, soft and easily torn. Owing to the lapse of time since death and heat of the locality, the viscera, bathed in extravasated blood, were to my great disapointment unfit for examination; indeed they could not be satisfactorily separated. That the ovary was distinct and the stomach empty was about all that could be ascertained. There are no teeth above the gums in either jaw and none could be felt by the knife beneath the skin.

MEASUREMENTS.

Length	12 ft. 4 in.	Girth of body	7 ft. 1 in.
Snout to pectoral ...	3 ft. 1 in.	Pectoral, length ...	1 ft. 3 in.
„ eye	1 ft. 9 in.	„ breadth ...	0 ft. 4½ in.
„ gape	1 ft. 2½ in.	Dorsal, length	0 ft. 9 in.
„ dorsal	7 ft. 6 in.	„ height ...	0 ft. 6 in.
„ vent	9 ft. 3 in.	Tail, breadth of flukes	2 ft. 10 in.
Girth of head	3 ft. 7 in.	„ depth	0 ft. 11½ in.

There is little doubt that the animal is Ziphius layardi, but until the skull and vertebræ are available for inspection a positive decision cannot be given.—C. W. De Vis.

An example of an unexpected source for water in the bush.—Two specimens of the stems of a vine *(Vitis sp.)* were exhibited, which had been procured from Spicer's Creek, twenty-four miles from Warwick, and which had been forwarded by Mr. H. Horwitz of that town with the information, that the plants from which they were derived, yielded on being tapped a supply of pure water for two days. The Hon. A. C. Gregory, in reference to other vegetable sources for water, alluded to a method of obtaining a palatable supply from young 'gum' (Eucalyptus) saplings, by lopping off their tops by a sharp oblique cut and then reversing them; also to a practice of the blacks in the south of treating the roots of Mallee Scrub, after cutting them into lengths, in a somewhat similar manner.

FRIDAY, 12TH DECEMBER, 1884.

THE PRESIDENT, J. BANCROFT, ESQ., M.D., IN THE CHAIR.

Reginald Roe, Esq., Brisbane, and Henry St. John Wood, Esq., Brisbane, were duly elected members of the Society.

The following donations were announced:—

"The Victorian Naturalist," Vol. I. No. 10 and 11. Melbourne, 1884. From the Field Naturalists Club of Victoria.

"Southern Science Record." Vol. I. No. 1-10, 13, and Vol. II. No. 2, 3, 6, 7. Melbourne, 1881-82. From W. Weedon, Esq.

"Proceedings of the Linnean Society of New South Wales." Vol. IX., Pt. 3. Sydney, 1884. From the Society.

"The Australian Irrigationist," Vol. I. No. 4. Melbourne, 1884. From the Editor.

"The Midland Medical Miscellany," Vol. III. No. 34. London, 1884. From the Editor.

"Russkago Geographicheskago Obshtchestva," Transactions, Vol. XX. Pt. 4. St. Petersburg, 1884. From the Imperial Geographical Society.

The following papers were read:—

EXPERIMENTS WITH INDIAN WHEATS IN QUEENSLAND,

BY

J. BANCROFT, M.D., PRESIDENT.

(Read on the 12th December, 1884.)

The samples of wheat here shown have been for several years grown at my garden, Kelvin Grove, from seeds originally imported by the Board of Enquiry into Diseases of Live Stock and Plants. This Board, commencing its labours in the year 1875 by a vote of the Legislature of £2000, in response to the advice of Mr. Haley, had, among many things submitted to it for solution, the question of rust in wheat, and considering the success that had followed the introduction of new varieties of sugar-cane, when the old Bourbon cane was nearly destroyed by the rust-producing acarus, I encouraged the Board to obtain seed wheat from all over the world, and as from India much wheat was beginning to be exported, I obtained from friends I had made there a considerable collection. Dr. Dymock, of Bombay, sent several sorts, and Mr. Anthony, of Lahore, wrote to wheat-growing districts and obtained others. It was thought that wheat grown in about the same range of latitude as Brisbane might be expected to succeed. Delhi, a great centre for wheat is in latitude 28·35, and north and south of it, in the Punjab, wheat is extensively grown, so it was reasonable to hope that in Brisbane, latitude 27·30, some form of wheat might be found that would withstand the ravages of rust. The first sowings of new wheats took place in the public gardens at Toowoomba, and out of curiosity I had sown at Kelvin Grove about a spoonful of each of the Bombay sorts.

Rye grew well at my garden and produced mature grain for several years previous, but the wheats then in cultivation in Adelaide and on the Darling Downs invariably perished with rust and like oats seldom perfected any seed. Before these enquiries I had been of opinion that rye was the only grain of the wheat

form that one could expect to grow near Brisbane, as it rarely suffered from rust. Some German families in Queensland ate rye, and during one season I had rye-porridge made for breakfast from grain grown at my garden and ground in a coffee-mill. Some of my family would eat it, and prompted somewhat by patriotic motives, I took this porridge daily for about a year. Now, a large patch of rye was grown and the grain sent to Mr. Pettigrew to be put through the process by which he manufactured wheat-meal. This better-prepared grist was cooked, but when brought to the table was found to have such a peppery taste that the cook was accused of letting the pepper-caster fall into the porridge, but no, all the meal had the same flavour, and it was discovered that our rye had been ground in the pepper-mill. This was my last experiment on the economies of rye.

To my astonishment nearly all the Indian wheat grew, producing ears and grain without being injured in any remarkable manner by rust. The Toowoomba experiments, carried out by the late Mr. Way, were equally successful with Indian wheats, French wheats and others giving little encouragement. A wheat was now heard of in Toowoomba that had come among canary-seed, and was found to withstand rust. Some bushels of it were purchased from Mr. Saxon, a farmer there, and distributed in the neighbourhood of Brisbane. This wheat, a tall bearded kind with hard grain, is still grown at the Bald Hills by Mr. Stewart and yields satisfactory returns.

Years later Indian wheat was distributed to many experimentalists, and Captain Hope, of Cleveland, proved that on his red soil fine ears of wheat could be grown to perfection. On comparing the Indian with such wheats as "Defiance," "Champion," and other European forms, it was found that sown side by side the Indian produced ripe grain when the European was shooting into ear, and that there was a difference of about a month in the speed of growth in favour of the Indian samples.

All Indian wheats, are, however, not rust-proof, and several beautiful white wheats, with soft grain perish after shooting into ear if planted in low damp and rich soil. The wheat most successful on such land is the tall dark-bearded kind. This wheat will succeed on the richest scrub-soil, free from any injury from rust. It may be grown in winter, and harvested in ample time to obtain a summer crop of maize. If sown in May on the fields from which maize has been gathered it may be cut in the end of October or beginning of November, leaving plenty of time for preparing the land for maize-sowing. I strongly recommend this course of cultivation for scrub-lands

instead of leaving the ground with dead maize-stalks on it to perfect a crop of useless weeds. This tall black-bearded wheat grows from five to six feet high, has a large hard grain, and though millers may not like to grind it for flour, the wheat will be found most useful for domestic consumption, equal, if not superior to maize, in fact, will turn out to be a second Indian corn of high economic importance.

There are now here four Indian wheats that I have selected as the forms most suited to our sea-board. The largest, No. 1, is that above described, with hard large grain, and adapted to rich scrub soil. No. 2 is the common Indian bearded wheat, which grows from three to four feet high, uniformly successful on higher land, the margins of scrubs, and on red soil country. The grain is of medium hardness. Two others are beardless wheats, very like English wheat, one with red chaff, the other white. The red, No. 3, is the more robust, and the grain resembles number 2. The white wheat, No. 4, has a smaller grain, about as soft as the European sorts generally grown in Australia. I submitted samples of this wheat to Messrs. Harrison & Co., millers in Terowie, South Australia, and obtained from them an opinion of its qualities. They considered the wheat a good milling sort, the best of the sorts I had sent, but injured by damp, as such grain has a very small black speck upon it. This spot, however, is formed on all grain, independent of damp and is well marked when grown in the driest situations. The ears of this wheat are not large, but I do not doubt if cultivated with care it would give a remunerative yield. Hard wheat does not suffer to the same extent from the ravages of moths and weevils as soft wheat.

Recently, Mr. Bernays has favoured me with a pamphlet on wheat, issued by the Punjab Government, compiled with great care to further the export of Indian wheat as bread-stuffs for Great Britain. Here are mentioned very many sorts that have never yet been tried in this country. On submitting the information to Mr. Dutton, the Minister for Lands, it has been decided to ask the Punjab Government to assist us by sending samples of as many kinds as possible, and the sum of £100 has been placed on the estimates to further the cultivation.

Now that we are assured of possessing wheats fairly rust-proof it is to be hoped that efforts will be made in producing wheat, as at present nearly all our flour in Queensland is imported.

It may be as well to mention here that great stress has been laid on the unsuitability of Queensland as a home for European

emigrants from the difficulty found in producing wheat, and Mr. Trollope, in his work on this colony, published in 1873, attaches great importance to this defect in the climate.

I have recently gone over the work with a view of extracting what he has said on the subject. At page 29, referring to Queensland, he writes:—"In the way of fruit it produces grapes, oranges, and pine-apples, but not apples, gooseberries, or currants. Wheat has been produced but not so as to pay the grower of it. Oats are grown, but are cut green or half ripe and made into hay." At page 33—, "Setting aside for the present the allurements of gold, I think that wheat-growing countries offer the greatest inducement to the class of men who generally emigrate from our own islands. In Queensland the bounties offered to emigrants are bestowed chiefly with the view of creating a class of small farmers, men who shall select small portions of the crown lands, by means of land orders or by gradual purchase, and who shall become freeholders and thus permanently wedded to the colony. The world wants wheat, but the Queensland farmers cannot produced it. Indian corn, or maize, is grown on these small farms, and oaten hay, and something is done in the manufacture of butter. But the markets for these things are bad. The farmer with his Indian corn is generally forced to take other goods for his produce,—tea, or clothes, or perhaps rum. Wheat he could no doubt sell for money. Such being the case the prospect to the small farmers is not good, and they who manage things in the colony not unnaturally find a difficulty in establishing permanent agriculturists on their soil." At page 39,—"It should be understood that the encouragement of the free selecter—of the genuine free selecter *(sic)* who intends to cultivate and reside upon the land—is and should be the first aim of colonial government. A race of men who will people the earth at the rate, say, of a soul to ten acres, must be of more importance to a young community than an aristocracy which hardly employs one man permanently for every ten thousand acres. Population is the thing required, and above all, an agricultural population. But agriculturalists, especially on a small scale, do not love a land that does not produce wheat. Hence the difficulty;—but on this account our warmer sympathies should be given to those who make the attempt, and every possible effort should be made to induce such men to settle upon the land." Again at page 103—"But these men, the aristocracy of the country, were impatient of such treatment; and too proud to endure such neighbours; and therefore they have bought the land themselves. They agree that, as

the climate is unsuitable for agricultural pursuits—as wheat cannot be made to grow in these regions with any permanent success," &c., &c.

These quotatins indicate the views of the writer; the British immigrant brought here must be able to do as he does in the old country, must eat the same food, grow the same crops, or he cannot be expected to be prosperous. From the slight glance at what is mentioned in the account given of New South Wales, I did not see that Mr. Trollope found anything better in wheat-growing there, and on a recent trip to what was formerly a great wheat-growing centre, Camden, I found very little wheat under cultivation, and a fine large mill lying idle. European wheats were so destroyed by rust that their cultivation was almost abandoned.

In Warwick, in our own colony, the European wheats were at times successful, and gave good returns, but were often a failure from rust, especially when the crop became, from moist weather, a trifle too succulent.

The Indian wheats so far as reported on when tried in our own higher lands at Toowoomba, were uniformly successful as seed-producers, but the millers thought the grain rather hard.

The millers in London, who purchase largely of Indian wheats, overcome this difficulty and make flour satisfactory to British consumers. Still, many varieties of the Indian wheats are not harder than European kinds. The hard ones resist the attacks of weevils and moths in a great measure, and so are easier saved for seed from season to season. In India dry earth is mixed with the seed wheat to protect it from the ravages of these insects.

By careful selecting of wheat from Indian sources it may be possible to set aside the verdict of Mr. Trollope, and prove Queensland to be a great wheat-growing country, and a suitable home for the British emigrant.

THE SAVO MEGAPODE.

By A. H. Kissack, Esq.

(Communicated by Henry Tryon.)

On recent visits to Savo, one of the Solomon group, I have had opportunities of becoming acquainted with facts, relating to the habits of its indigenous Megapode and the treatment which it receives at the hands of the natives, which I believe are not generally known.

Mr. G. R. Gray (P.Z.S. 1861) in 1861 furnished a list of the Megapodes which were then recorded and a summary of what had been written concerning the habits of these remarkable birds, a subject which has been dealt with in more than one of the recognised descriptive works of travel relating to the numerous Indo and Austro Malayan regions, throughout which the Megapodidæ have been scattered. Since 1861 several species have been described in the Proceedings of the Zoological Society and other publications, and the more general distribution of the group indicated by A. R. Wallace in his "Geographical Distribution of Animals" (Op. Cit. vol. II. p. 341).

The first reference to the Savo* bird appears to have been given by Dr. G. Bennet, F.L.S. who in a letter (P.Z.S. 1862, p. 247), mentions the fact of Mr. Dawson's having procured living birds from the Island of Savo, which unfortunately shortly afterwards died, and that the eggs were collected by the natives and offered for sale. Subsequently amongst eggs of Megapodes forwarded by Mr. John Brazier to England, were examples from Savo, concerning which Mr. Brazier wrote that the natives brought these eggs off to passing ships by thousands (P.Z.S., 1874, p. 606.)

More recently the bird from Savo has been described by Mr. E. P. Ramsay (Proc. Lin. Soc. N.S.W., 1880, Vol. IV. p. 75) who refers it to *Megopodius brenchleyi*, G. R. Gray, previously characterised from immature specimens. Commenting on Mr. Ramsay's identification (op. cit. vol. vi, p. 150, 1881) Mr. Brazier has pointed out that Mr. Ramsay has wrongly associated the Savo Megapode with *M. brazieri*, Sclater, named from

* Dr. Bennett spells the name *Sava*, and Mr. Brazier's eggs were forwarded from *Savu*, whilst Mr. Ramsay's bird came from *Savo*, all purporting to be situated in the Solomon Group. Mr. Brazier further states (Proc. Lin. Soc.. N.S.W., 1881, vol. vi., p. 150) that Savo "is know as Savu, Galera and Russel Island," but the *Savo* referred to in this paper is certainly not Russel Island; but a small very hilly and wooded island, three or four miles in extent, situated between Isabel Island, the Floridas, and Guandalcanar.

eggs procured from Vanua Lava, Bank's Group, and was probably in error in identifying it with *M. brenchleyi*, G. R. Gray procured during the voyage of H.M.S. Curçoa not from Savo but from Ugi or Gulf Island, another of the Solomon Group, but far distant, also that *M. brenchleyi*, and *M. brazieri*, Sclater, could not on reasonable grounds be considered as synonymous.

Like the other Megapodes these birds frequent during the day the wooded portions of the Island so that the number which resort to the Savo settlement during the season or throughout the year for the purpose of laying their eggs is difficult to estimate, but that it amounts to several thousand I have no reason for doubting. The proportion between the sexes too cannot be arrived at, through they are probably monogamous, as any distinguishing features which they may possess are very obscure, and to an ordinary observer both sexes are alike in habit and general plumage, and even the natives ludicrously remark that all the birds lay. Though probably distributed throughout the island at other seasons, when the eggs are to be deposited the birds resort to a certain portion of the beach which is here composed of a coarse grey sand 10 feet in depth. As in the case of *M. stairi*, Gray (P.Z.S. 1861.) concerning which F. Hübner remarks (P.Z.S. 1877, p. 784) that the breeding season is not confined to certain months, the Savo Megapode seems to be laying from one end of the year to the other though there are undoubtedly months in which the eggs are more plentiful than in others.

Though the generality of birds of this genus, like our Australian species, build large and conspicuous mounds in which their eggs are placed and whose large proportions formerly suggested the inference to one of our early voyagers that they were the veritable nests of the allegorical Roc.; this bird on the other hand, as is the case with *M. wallacei*, G. R. Gray, from Bouru (P.Z.S., 1867) makes no mound whatever but is perhaps careful to obliterate any signs of the more immediate neighbourhood of its eggs.

Wherever the sand is easy to dig and possesses firmness sufficient to prevent its "caving in" the birds burrow obliquely downwards for three or four feet. Occasionally two birds are engaged alternately at the same burrow, one after digging for 5 or 10 minutes giving place to another bird which goes quietly to work whilst its comrade preens its feathers close by. Side burrows lead from the main one, each of which receives a single egg and is afterward filled up, when the main burrow is also filled up.

The number of eggs contained in each hole varies from eight to ten and it is generally supposed that each of these in a single burrow is laid by a different bird, since it is an ascertained fact that a considerable interval must necessarily lapse between the laying of successive eggs in all Megapodes, and a burrow would have to remain open a long time to receive all the eggs of a single bird. On the other hand I am inclined to think that each burrow contains the eggs of a single bird only, since these eggs often bear evidence of having been deposited at long intervals, the mouths of the burrows are often open for a moderate length of time, and the birds are fully capable of filling in the burrow after each successive laying.

The number of eggs laid during a season by a single bird cannot be ascertained. The mothers care seems to cease with the deposition of each egg which in the hot sand takes from five to six weeks to hatch—the egg of the Labuan Megapode, *M. Cumingi*, Dillwyn, which is a mound-builder, is said however to take from three to four months (P.Z.S., 1851.)

On one occasion I packed some eggs in salt and they hatched in a fortnight, but in this case I did not know what period had elapsed since their having been laid. The young birds I managed to keep alive on board ship for a month feeding them on insects, yam, and chopped up egg, and it was only when my supply of the last mentioned article failed that the birds died. More recently I hatched two by simply placing them in tow and leaving them on a shelf, but these I knew to have previously arrived at rather an advanced stage of developement. On their being hatched the young birds quickly dig their way out through the sand which covers them and immediately run off and shift for themselves. At this time they are fully feathered. When hatched under such artificial circumstances as those which I have referred to the birds are at first covered with a sort of thin skin-like investment which peels off on the 2nd day, and though the birds remain in a semidormant condition for three or four days their latent energies can, even during this early period be brought into operation, and one which I had on being aroused from this inactive condition flew from the ship to the land a distance of fully half a mile.

In the descriptions of other Megapodes and their habits writers have pointed out or suggested their extreme shyness; at Savo on the other hand what is more especially noticeable is their remarkable tameness, the birds affecting to take little notice of even a white man, running about, a few yards from ones feet. This is soon accounted for by the note-worthy fact that the Savo

natives adopt stringent measures to protect these birds, recognising in their eggs a species of property in which they all participate and a valuable article for home consumption or foreign commerce. The birds themselves are never molested by the natives and are accordingly very confident, so much so that they subject themselves to the attacks of cats and dogs, and one form which the protection accorded them by the natives takes is that of watching systematically and destroying any animal which is found destroying them. The value placed on the birds too is great, that on one occasion I offered all sorts of 'trade' for a single pair without result. This however may be partly accounted for by the nature of the taboo set over them by the natives.

The areas occupied by the burrows containing eggs are carefully plotted out, by means of bamboos; and even all the leaves, branches, or other debris are removed from the surface. These plots are about ten yards long by five yards wide. The chiefs have four or five plots each and others a less number according to their rank or station. As all holes do not contain eggs at the same time, it is necessary to discover those which do, an insight which the natives can readily acquire. Now as each side or secondary burrow is filled up after the egg is placed in it, it does not yield on pressure from above by the foot, which will happen if the side burrow is still unoccupied, and a useful indication is hereby afforded by means of which the presence of eggs can be discovered. Although I have visited several other islands where Megapodes abound I have never met with a similar protection bestowed on them, or any other birds, to that exercised by the natives of Savo.

Referring to the bird inhabiting Nau Fou, one of the New Hebrides Group, Dr. G. Bennett (P.Z.S., 1862, p. 247) quoting Capt. MacLeod, states that the *mallow* which builds its mound one or two feet high in the sulphur looking sand in the centre of the island is protected by the chief by whose permission only can eggs or birds be procured, but how far this protection has been carried does not appear to have been subsequently narrated. The number of eggs which the natives procure annually at Savo is almost incredible. They consume them themselves from day to day, preferring the eggs when they are somewhat advanced towards being hatched. Ships also are frequently passing to and fro and purchase two to five hundred eggs each. Moreover there are exceptional demands made on the supply. These are at their large feasts at which it is estimated that 10,000 eggs are sometimes consumed. I am not aware that any measures are taken to secure a certain number of

young birds being hatched out each year, but that the natives are fully alive to the benefit which they derive from this system of bird preservation, and are cognizant of the great drain which takes place on the supply annually available is very certain; so much so indeed they have considerably greater notions of their exchangeable value of late years. At one time a stick of tobacco would procure twenty eggs, and now only three or four.

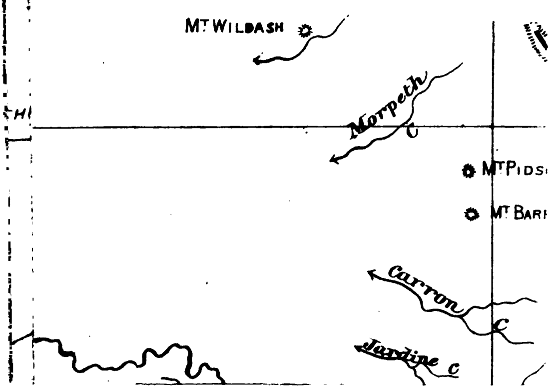
That so-called savages are fond of keeping and taming animals of all kinds is well known, and has been alluded to by several writers, notably by Galton (Ethnol. Soc., Dec. 22, 1863) and Darwin ("Animal and Plants, etc." Vol. II, p. 144, *note*) that this predilection has been turned to such profitable account by any of them as in the present instance has been seldom if ever related. We have here another instance of how domestication of animals has been probably brought about, *i.e.*, by their having acquired, or being naturally endowed, in the first instance with fearlessness of man.

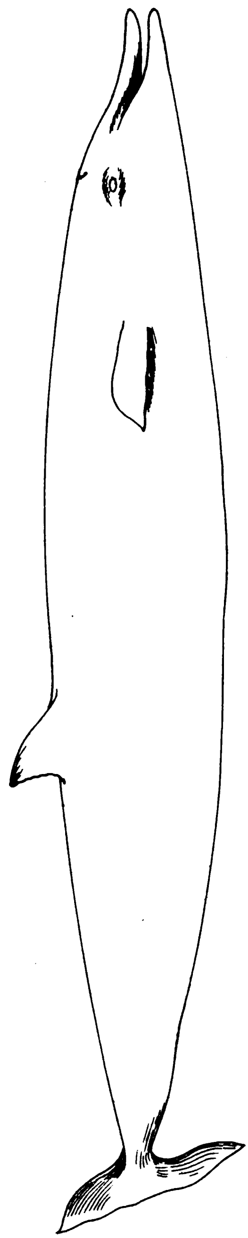
INDEX.

Warwick & Sapsford, Printers, Eagle Street, Brisbane.

RS

Plate II





ZIPHIUS LAYARDI, FLOWER.

Do not follow!

DIRECTIONS TO THE BINDER.

CANCEL—Title Pages of Parts I. and II., and pages ii.-viii. of Part I.

ORDER OF BINDING—New Title Page (Part IV.), Objects, Rules, Officers 1883-4, Officers 1884-5, List of Members, Contents, Letterpress (pages 1-185), Index (pages 187-198), Plates, i.-xix.

CONTENTS OF VOL. I., PART IV.

3

11

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